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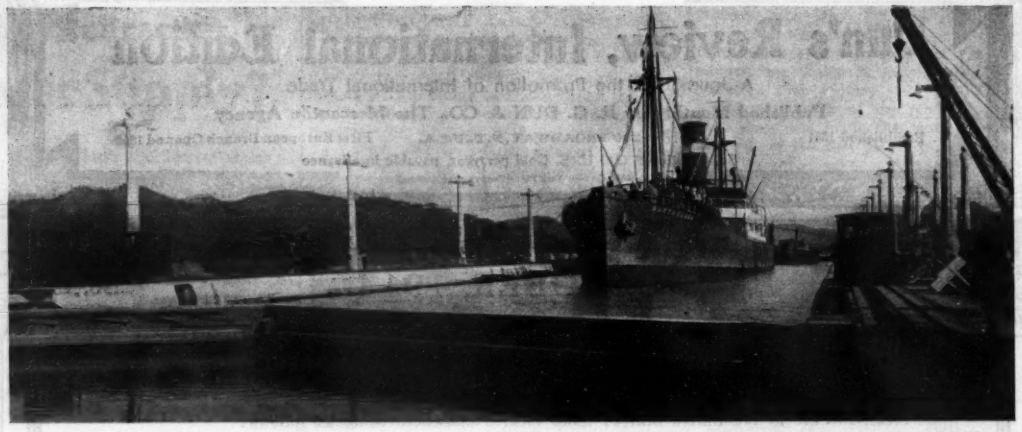
Correspondence regarding any topic of international trade interest is invited from readers of the Review and contributions on such subjects, if available for publication, will be paid for at space rates. Photographs of commercial scenes will be purchased, if suitable for reproduction. Manuscripts and photographs not used will be returned promptly if postage is sent for that purpose.



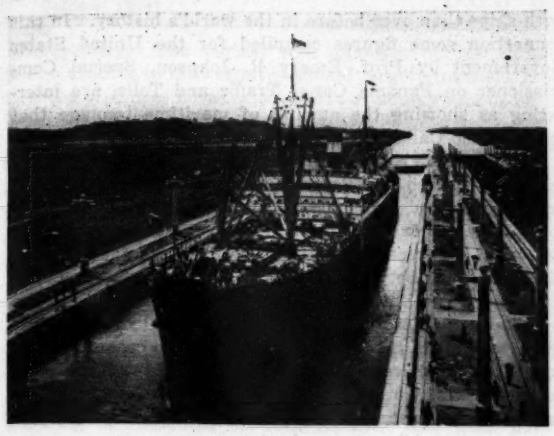
Courtesy Isthmian Canal Commission.

The Steamer "Santa Clara" in the upper west chamber of the Miraflores Locks, ready to be lowered to the level of lower locks in a test opening June 19.

Contents

The 10,000-ton Steamer "Ancon" approaching the Gatun Lock from the Atlantic end of the Panama Canal, August 15. The man at the right directing the opening is Col. Goethals.

Photo (c) by Underwood & Underwood, N. Y.



Courtesy Isthmian Canal Commission

Steamer "Ancon" leaving middle west chamber of Gatun Locks in test opening June 11, 1914

Courtesy Isthmian Canal Commission

Steamer "Ancon" entering upper lock from middle west chambers under tow of electric locomotive

WHAT THE PANAMA CANAL MEANS TO SOUTH AMERICA AND THE ORIENT

By Shortening Distances it Increases Steamship Facilities, Particularly to New York and Eastern United States, to a Corresponding Degree

SOUTH America, the Orient and the United States are the first to feel the quickening impulses of the new currents of trade through the Panama Canal. This great door looking upon the future was thrown open August 15 last, but in the tumult of the mighty war that had just begun this momentous event passed comparatively unnoticed.

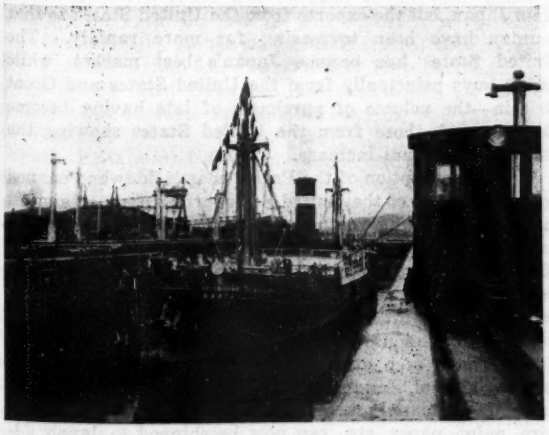
The shortening of any road by land or sea means an increase in trade between the places that thus are brought nearer together. Also the efficiency of the vehicles of transportation is increased in direct proportion to the saving in time that is effected. The opening of the Panama Canal has brought more than half the countries of the globe many miles closer to each other. In some cases the time of voyages between two ports has been cut in half. That is almost equivalent to doubling the number of ships. For example, one day the latter part of August the first steamer reached New York with a cargo from San Francisco, via the Panama Canal. The voyage took thirty days instead of sixty-five around Cape Horn. Two trips can be made in the time formerly necessary for one. How much this means in the aggregate may be gathered from a few figures.

From New York to San José de Guatemala the distance via the Canal is only one-third what it is via the Straits of Magellan, to Iquique it is less than one-half, to Valparaiso a little more than half, and so on. Yokohama and Shanghai are well within the Panama traffic zone. The distance from New York to Yokohama is 3,768 and to Shanghai 1,876 miles less via Panama than via Suez. The Canal has brought Sydney, Australia, about 4,000 miles nearer New York, Melbourne is 2,770 closer and Adelaide 1,746 miles. The distance from New York to Wellington, New Zealand, via the Straits of Magellan, is 11,344 miles, and via Panama, 8,851.

How much the population of the seas has been increased, theoretically, by this shortening of distances and time of voyages might be calculated with fair exactness if the world's maritime trade, or a considerable portion of it, were not unsettled by war. Beginning in 1909 there was an unprecedented boom in shipbuilding. It continued uninterruptedly until recently and left the seas more peopled

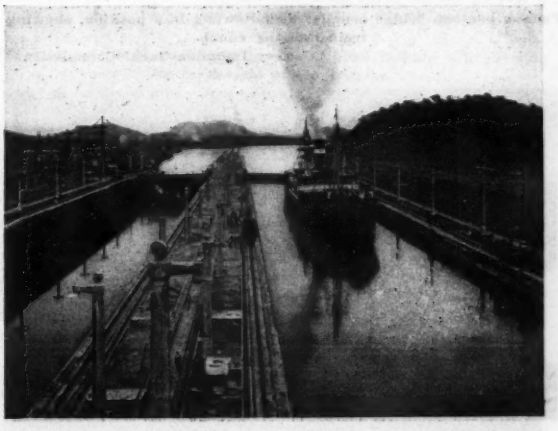
Steamer "Santa Clara" in lower west chamber of Miraflores Lock ready to be raised to level of upper lock

Courtesy Isthmian Canal Commission



Steamer "Santa Clara" after water level had been raised in test opening June 18, 1914

Courtesy Isthmian Canal Commission



Courtesy Isthmian Canal Commission

The famous Culebra cut, showing dredges at work on Cucaracha slide and canal channel, January 28, 1914

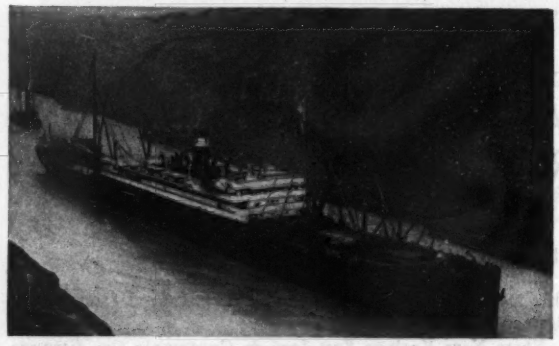
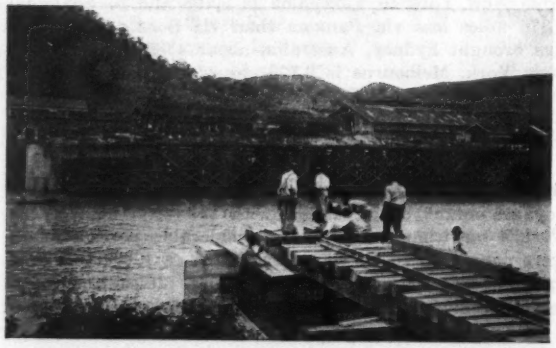


Photo (c) Underwood & Underwood, N. Y.

Steamer "Cristobal" passing through Culebra cut August 3, at about the same point shown above



Courtesy Isthmian Canal Commission

Paraiso pontoon bridge in position to swing and almost completed, May 4, 1914

Paraiso pontoon bridge completed and swung into position, showing train crossing canal

Courtesy Isthmian Canal Commission

with ships than ever before in the world's history. In this connection some figures compiled for the United States Government by Prof. Emory R. Johnson, Special Commissioner on Panama Canal Traffic and Tolls, are interesting as showing the amount of maritime tonnage that may use the Canal and the new routes that it has created.

Prof. Johnson estimates the total tonnage of vessels that might have used the Panama Canal in 1910 at 8,328,029 net register, and that in 1914 this would rise to 10,500,000 tons. The increase in the next ten years he places at 60 per cent. The vessels that might have used the Canal in 1909-10, plying between Europe and Western South America, aggregated 3,148,000 tons, and between Europe and Oriental countries east of Singapore and Oceania, 1,174,585 tons. From the Eastern United States coast to Western South America, Pacific Mexico and Hawaii, the estimated tonnage via the Canal was 363,426, and with Oriental countries east of Singapore and Oceania, 1,500,000 tons.

The unprecedented disturbances caused by the European war, however, have changed, for the time being, almost all the former movements of trade. The sources from which South America and the Far East have been drawing their supplies of merchandise and raw materials, are now, with the exception of the United States, practically closed. Therefore the opening of the Canal will have an especial meaning and effect upon the Orient, a great part of the Southern Hemisphere and the United States. There cannot fail to be a tremendous interchange of commodities between these vast and incalculably rich regions of the earth. What the Far East and the Far South need and have to offer in return is, at this time, of especial interest and importance.

The industrial progress of Japan is widening greatly its range of imports. Like all the rest of the Far East, wages in Japan are rising rapidly. In many lines they have reached the point where man-power is no longer cheaper than steam or electricity working through machines. This means new wants. In fact the industrial revolution of Japan and of Eastern Asia has only just begun. Its development will mean a tremendously increased volume of trade with the United States.

Japan exports silk, straw braids, mattings, cotton yarns, cotton cloth, coal, tea, camphor, rice, mushrooms and miscellaneous manufactures. The imports consist chiefly of raw cotton and cotton manufactures, woolens, sugar, rice, beans, peas, oil cake, steamships, locomotives, steel rails, iron manufactures and machinery. It will be noted that Japan is both an exporter and importer of rice. This is because, with increasing frequency, the Japanese rice crop is not sufficient to meet the demand. In fact, among the very poorest of the population, rice is a luxury.

Japan has been drawing much of the cotton, rice, beans and peas that she consumes from the nearest sources of supply—the adjacent regions of Asia. The commerce with the United States has been mainly in metal manufactures, dry goods, raw cotton and foodstuffs. There has been a steady growth in the importations into the United States from Japan, but the exports from the United States to that country have been increasing far more rapidly. The United States has become Japan's best market, while Japan buys principally from the United States and Great Britain—the volume of purchases of late having become almost equal, those from the United States showing the most rapid annual increase.

With the exception of the Pacific coast's flour and canned goods, the trade of the United States with Japan originates in the eastern and southern States, where the manufacturing industry is the greatest. Formerly Europe had an advantage as against this trade in point of distance. Now that the Canal is open, the United States will be able to supply Japan with larger amounts of bulky articles whose cost of production is relatively so low that the freight charges have been difficult to overcome. Such things as cement, alcohol, condensed milk, glassware, agricultural implements, manufactures of iron and steel, machinery, wire, paint, paper, etc., can now be shipped to Japan ad-

vantageously. The variety and quantity of the United States exports to that country should largely increase, now that the distances between the ports of supply and demand have been shortened so materially.

The trade of the United States with China has also been growing with astonishing rapidity. Some of it has been going by way of Europe and has been credited in the statistics to European countries. Much of the rest has moved via Suez to Hong Kong, which is one of the great distributing centers for imports into China, and even for the Philippines. Breadstuffs and lumber will continue to go across the Pacific from the western coast of the United States, as well as manufactures of high value and small bulk. The trade in provisions, which is as yet comparatively undeveloped, should increase rapidly, owing to the opening of the new gateway and the great lessening of distances between Atlantic and Gulf ports and those on the coast of Asia. Heavy manufactures of iron and steel and manufactured cotton goods will be affected more favorably by the Canal than any other class of merchandise sent to China. It is estimated that 70 per cent. of the cottons exported from the United States to China are produced in the southern States, the section nearest the Canal. Most of these cotton goods have been going to northern China, which was the most remote from the United States via Suez. It is now the nearest by way of Panama.

The export trade of the United States with Australia has been increasing faster than that to any other country except those of eastern Asia. The total foreign commerce of Australia is about half that of all South America. Australian trade centers largely in Sydney and Melbourne, and these ports are brought many days nearer the eastern half of the United States by the Isthmian Canal. The effect of the opening of the Panama route on Australia and Oceania cannot be overestimated. The United States has been sending to Australia a large variety of commodities, especially manufactures of iron and steel. As in the case of other distant countries, the length of the voyage and consequent cost of transportation has been a handicap upon the trade in many commodities, but this disadvantage of distance is now removed. The future commercial importance of Australia will be very great. The industries of that commonwealth are such that a heavy foreign trade is requisite to their development.

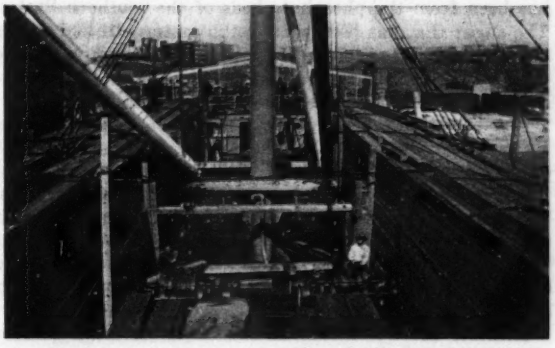
The commerce of New Zealand is greater per capita than that of Australia. The exports of the United States to New Zealand—seven-eighths of which has come from the Atlantic coast region—include mineral oils, tobacco, machinery, hardware, wire and wire nails, carriages and carriage materials, medicines and boots and shoes. New Zealand is still mainly in the grazing stage of industry. It has great deposits of iron and coal, but the development of these has been only sufficient to supply the local demand. As in Australia, the development of manufactures in New Zealand will be slow. In the meantime the demand for manufactured goods will continue to increase, and in exchange for them the islands will export food products and raw materials. Since the opening of the Canal brings New York more than 5,500 miles nearer New Zealand than it was by the Good Hope and Australia route, an exceptionally rapid increase in trade between the two countries is looked for.

Great Britain and Germany have controlled a large share of the Philippine trade, but now that the ocean road between the eastern United States and the Islands has been shortened, there should be a large market for cotton goods, flour, provisions, petroleum, iron and steel manufactures, and machinery of all kinds.

The resources of the Hawaiian Islands are almost exclusively agricultural. There are no mineral deposits of any consequence, and manufactures are and always will be insignificant. But the sugar industry is a mine of wealth in these islands. Rice is the second crop in value, and tropical fruits may become increasingly important exports. Practically all the iron and steel articles used come from the United States. Of the fertilizers used, a

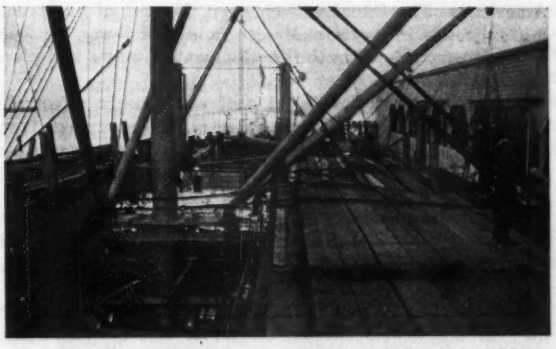
Courtesy Luckenbach S. S. Co.

Steamer "Damara," one of the freighters that will use the canal, showing height of deck load



Courtesy Luckenbach S. S. Co.

Forward end of steamer "Damara," showing load of lumber with hog chains, stanchions and lashings

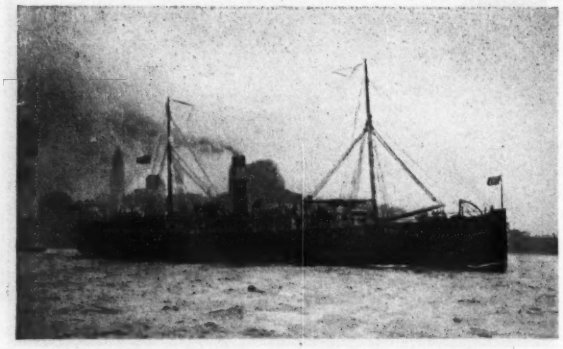


Courtesy Luckenbach S. S. Co.

After end of steamer "Damara," showing cargo of tin on No. 5 hatch and car of tin alongside

The steamer "Damara," from forecastle head looking aft, showing tin on several of the hatches

Courtesy Luckenbach S. S. Co.



Courtesy Panama Railroad Co.

The steamer "Advance," which went from the Atlantic side with a party of long service employees on opening day

part has been coming from Germany, but the larger share has been from the phosphate beds of the southern States. The sugar that has been sent to the eastern United States has been moving via Cape Horn and via Tehuantepec. The Canal will cheapen the cost of transportation to the Atlantic seaboard by at least one-third.

The commerce of the eastern ports of Central America is largely controlled by the United States, while that of the western slope has been with Europe. This Central American trade has not yet reached large proportions, but it has been growing and it is expected to increase with unprecedented rapidity. The Canal will enable each of the coasts of the United States to find a market on the opposite seaboard of Central America, which will result in a large promotion of commerce.

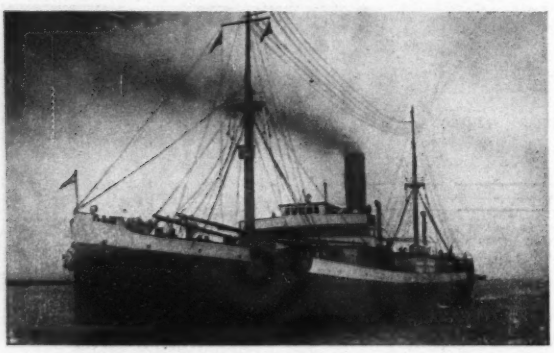
Hitherto the western coast of Mexico has been able to trade with Europe better and cheaper than with the United States. The opening of the Canal now gives it closer connections with the United States than with Europe, which will enable the means of the commercial and industrial development of that region to become largely American. The Canal will cheapen the cost of constructing railroads in western Mexico, and will lower the cost of machinery needed in the development of mines and plantations.

The opening of the Canal will not greatly affect the Atlantic countries of South America. The exports from both South and Central America are mostly raw materials, of which rubber, coffee, cacao and nitrates are especially important. The western third of the Continent will be the most affected by the Canal. Callao, Peru, is farther by steam from New York, via Cape Horn, than the South Pole. Via the Canal it is now 1,000 miles nearer New York by steam than San Francisco.

The western part of South America is, generally speaking, far less developed than the other side of that Continent. It lacks railways and industries of all sorts. One of the first effects of the west coast being brought nearer to the great manufacturing centers of the United States

The S. S. San Francisco of the New York and Vancouver Line, one of the vessels going regularly through the Panama Canal

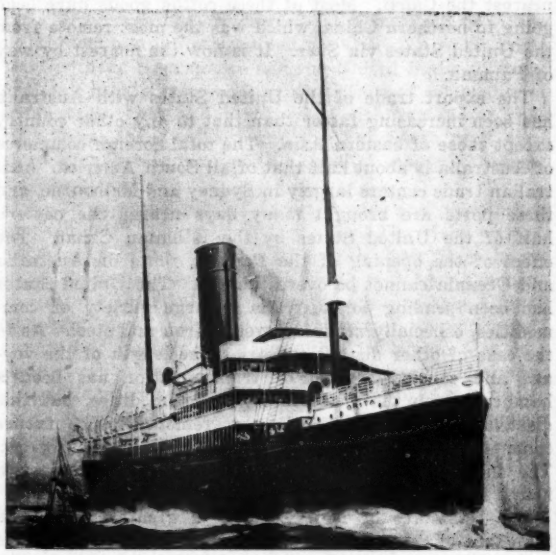
Courtesy of Houlder, Weir & Boyd.



will be the building up of better means of land transportation. The growth of commerce and industry cannot fail to be given a tremendous impulse. The ports of the United States are now from two to three thousand miles nearer the west coast than those of Europe. Callao, Peru, has the same longitude as Washington, D. C., and Antofogasta and Iquique, the chief nitrate ports of Chile, the longitude of Boston. On the other hand, the eastern point of Brazil is 2,600 miles east of New York, and it is as far from that city as from the English channel.

The great advantage of the trade between the eastern United States and western South America is that there will be a heavy traffic both ways. The exports from the United States will be of a similar class of articles as are being sent to China and Australia, with the probable addition of coal. In return the ships will bring Peruvian sugar, Chilean nitrate, ores and heavy produce. The possibilities of this incalculably rich region are so tremendous that they can only be indicated here in the most general terms.

In the first month after the opening of the Canal most of the steamers that made use of it, owing to the abnormal conditions that prevailed, were those carrying cargoes between the Atlantic and Pacific seaboards of the United



Courtesy Royal Mail Steam Packet Co.

The steamer "Orita," type of passenger steamer that will be put in service via Panama Canal

States. Of these lines that maintain a regular service the largest is the American-Hawaiian, which has 26 steamers with an aggregate cargo capacity of 260,000 tons. These ply between New York, California and Puget Sound ports, and Hawaii. As soon as sailings are rearranged, this line will have a boat going through the Canal every 72 hours.

The Luckenbach Steamship Company has ten vessels in service between New York and California ports, via Panama. They average 10,000 tons each. Two more steamers are building for this line.

The New York and Vancouver Line runs between the two ports named, and also via Panama from British Columbia and California to Europe. The number of its steamers varies according to the demands of the traffic.

W. R. Grace & Co. have ten steamers in the South American trade, and four in the North American Atlantic-Pacific coast service. A boat of this line passes through the Canal once every fortnight.

There are no regular and frequent sailings as yet from New York, via Panama, for Australia, New Zealand or Asian ports. A rapidly increasing number of steamers, however, are loading for these destinations, and with the steadying of the maritime situation the great effects of the opening of the gates of Panama will soon be apparent in every one of the countries mentioned in this article.

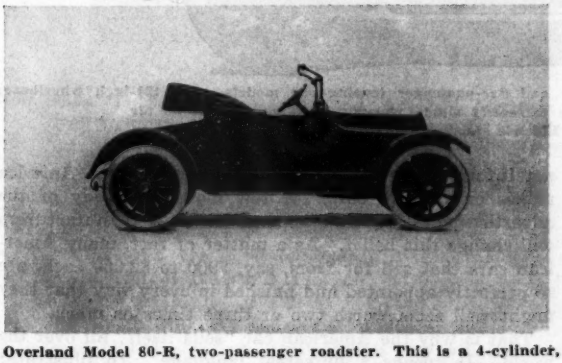
The Hudson Motor Car Co. could not get its automobiles to dealers quickly enough by freight last summer; so it shipped more than half its product by fast express, in solid trains, from Detroit to New York, Philadelphia, Chicago and other points

THE KIND OF MOTOR CAR AGENCY THAT PAYS

Carrying in Stock the Various Types and Qualities of Cars Best Suited to the Needs and Tastes of the Agent's Particular Market

ONE factor that has made the United States pre-eminent as a producer of motor cars is that it has greater diversities of climate and contour than almost any other country in the world. Therefore the American car is built to meet every condition, no matter how difficult. It runs equally well in Arctic cold or tropic heat. It is as reliable in desert sands as in miles of marsh. It has a wonderful facility for climbing mountain sides, and, after the strain of ascent and descent, skims across the level plain or the asphalt pavement as if it had been built especially for that instead of for all purposes.

Another thing that is equally true of the American car is due to the tremendous rapidity with which the automobile industry has developed in the United States. Within half a dozen years the motor car sprang from a luxury to a necessity. There were tens of thousands of new car owners every year. Comparatively few of them had any mechanical knowledge. This resulted in making the



Overland Model 80-R, two-passenger roadster. This is a 4-cylinder, 35-horsepower machine, with electric starter and lights

American car a model of simplicity—easy to keep in repair and hard to get out of order. Strength, lightness, durability and simplicity are the characteristics of the American car.

Because of these and other qualities that have been evolved by incessant industry, patience and skill and the aggregate expenditure of huge sums of money in experiment in every branch of science to make every part of the car as nearly perfect as possible, the American automobile has been able to compete successfully with all other makes in every market of the world. The soft purr of the American motor is now heard in Sydney as well as London, in Bombay and Manila, and in the remotest corners of the earth.

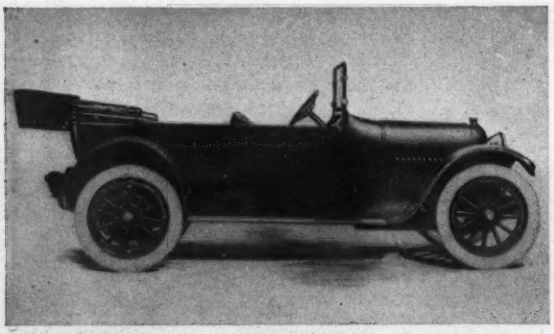
The demoralization of industry consequent upon the war has, for the time being, made the obtaining of cars of European manufacture practically impossible. Automobile agents who have been carrying them must look elsewhere for their future supply. In this emergency automobile dealers all over the world naturally are turning to the United States to secure their requirements. It is to furnish information and suggestion that will make their search easier that this article is written.

Practically every known type of motor car is made in the United States. The standard kinds are produced in enormous numbers. There are few automobile factories in the United States that make less than 1,000 cars a year. Some produce fifty or a hundred times that many. It is this large scale of production that enables American manufacturers to put the best of materials and workmanship into their cars and yet sell them at such amazingly low prices.

In the American automobile factory labor-saving machinery is carried to its highest perfection. Every part of the motor car is made with absolute accuracy. It is tested scientifically and mechanically by automatic machines that never err. The human brain and the human hand evolve and direct, but the marvelous untiring mechanisms see that everything is kept up to its standard of strength and

Howard E. Coffin, engineer of the Hudson Motor Car Co., in a 1915 Hudson Six-40, which typifies his highest ideal of a car

durability. In the laboratories of these factories testing and experiment go on incessantly. The idea is to produce a car that is harmonious in its physical strength as well as in its beauty, a machine that shall be as light of weight as may be and yet as strong in every part as the toughest metal can make it. To attain this, alloy steels, costing



Moline-Knight touring car, five-passenger, guaranteed 50-horsepower, 128-inch wheelbase, electrically equipped

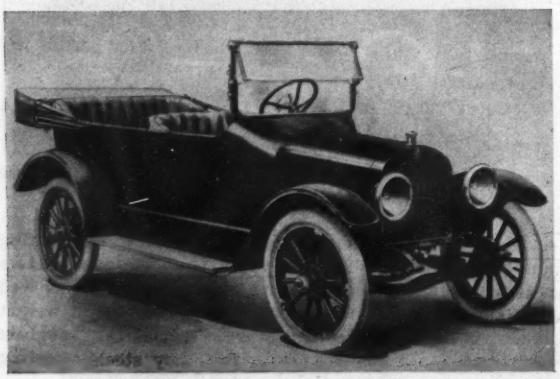
ten or twenty times as much as ordinary steel, are used where strains and shocks are likely to be felt. If only a hundred cars were built in this way they would be too costly for any but the very rich. But where the output is a thousand or more from a single factory the cost decreases with the increase in the volume. That is one of the reasons for the cheapness and excellence of the American car.

In size and power the American car runs from the smallest to the greatest. There are several makes of four-cylinder cars with ten or twelve horsepower engines. These cars are of the roadster type and seat two persons. They sell for less than $500 each at retail.

There are a still greater number of makes of four-cylinder cars, ranging from 20 to 27 horsepower and seating from two to six persons, that are sold to consumers in the United States at from $500 to $1,000 each.

The cars priced at from $1,000 to $1,500 are made by more than a score of factories. These are also four-cylinder cars and range from a little under 17 to a little more than 25 horsepower.

The King Motor Car Co.'s Model C, five-passenger touring car; 4-cylinder, 30-35 horsepower, electric starting and lighting



The next group ranges in price from $1,500 to $1,800. The majority of these are four-cylinder cars, but there are some of six-cylinders. Horsepowers average higher, from a little under 25 to more than 30 as a rule.

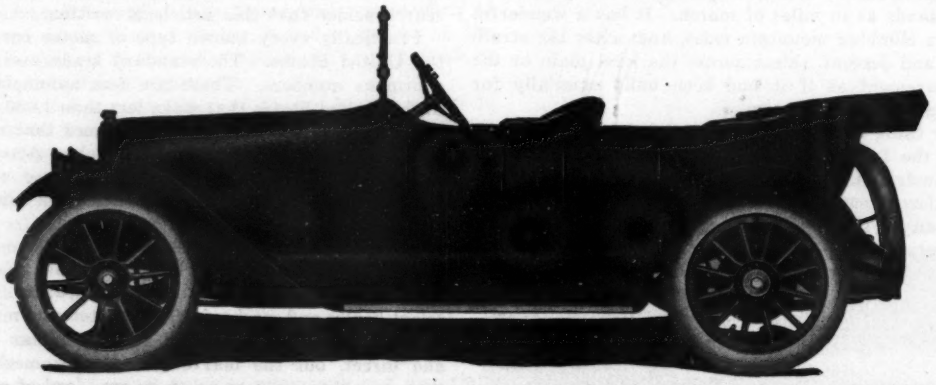
Another popular class of cars sells for from $1,800 to $2,000. In these the six-cylinder type begins to predominate. Several of them are more than 40 horsepower, although many of them are between 30 and 35. There is a great variety of body type—touring, coupé, landau, cabriolet, phaeton, etc.

These types also run through the next price class, from $2,000 to $2,500. In this, as well as in the preceding class, the seating capacity is greater—from four to seven persons, and the six-cylinder type of motor is also in the majority.

The cars priced at from $2,500 to $3,000 are nearly all six-cylindered, and run in horsepower from a little above 30 to more than 50. These also are built in many styles of body. The number of four-cylinder cars in the $3,000 to $4,000 class is comparatively small, most of the engines being "sixes." The horsepowers are about the same as in the preceding class.

In the cars in the three groups of price—from $4,000 to $5,000, $6,000 and $7,000 and over—the six-cylinder motors are universal. In these larger cars there are many of 60 horsepower, though there are some under 40. The style of body also varies—touring, runabout, coupé, berline, roadster, limousine, brougham, landaulet, phaeton-landau, semi-berline, etc.

There are still other cars of American manufacture that sell for more than $7,000. Not a few persons who have not informed themselves have the opinion that America makes only cheap cars. A few moments' study of the advertisements of American automobile manufacturers will change this belief. As a matter of fact, many American cars that sell for from, say, $900 to $2,000 each, are so perfectly appointed and finished in every way that they might well seem worth two or three times as much.



The Haynes Model 30, a "Light Six," built in two-passenger roadster and five-passenger touring car models, with 121-inch wheelbase; weight, completely equipped, 2,950 pounds. It has an extremely simple vacuum gasoline system—no air pumps or pressure regulators. Electric starting and lighting

That is why the American car "sells itself" all over the world. It speaks a universal language. To illustrate: Within the last year or so two American consuls, in two widely separated parts of the world, had the same experience. Each was stationed in one of the remote outposts of the earth—one in the Far East and the other in the Far South. Each knew from experience the excellence of the American automobile. Each tried to get a local merchant to secure an agency and put one or more machines in stock, but without result. Finally, each of these consuls ordered a car of his favorite make and pattern, sending a draft for the amount with the order, like any purchaser. In due time the machines came—one to the man whose consular abode was where the West is East, and to the other in the southern hemisphere where the seasons are upside down according to northern ideas.

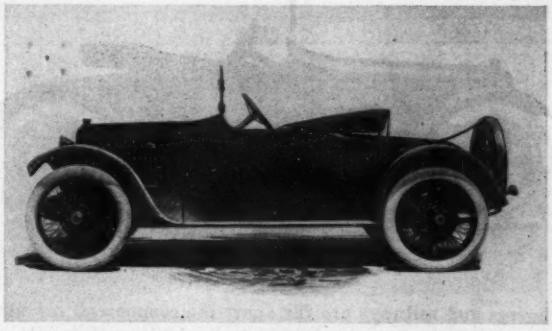
The result astounded the local merchants, who had never seen an American automobile and who had not had the commercial courage to order one. Within a fortnight after

the consuls received theirs and began to go about in them more than a dozen persons came to them and asked how to get similar cars. Then the local merchants began seeking agencies for American machines, and to-day they are selling them rapidly. Or, rather, the cars are selling themselves rapidly, for very little verbal persuasion is required.

One of the great aims of the American car builder is to design his product for the utmost comfort and convenience of the driver and passenger. There are electric motor starters, the machinery is as nearly noiseless as possible, the control equipment is placed where the driver can operate his car conveniently—there is no end to the efforts in this direction.

Another advantage is that American cars are sold completely equipped with all their accessories. The price named is not for the bare car, but it includes everything that is needed. In other words the car that is bought for $500 or $5,000 is ready to step into and drive away in, 500 or 5,000 miles.

While the American car sells itself, it has to be present to do the selling. An automobile cannot be sold to a consumer simply by showing him a catalogue or reciting the description. Therefore the merchant who seeks to meet the demand for automobiles in his section, or to awaken it, should secure an American manufacturer's agency and put in stock as many types of cars as can be sold in his market. The American factories, as a rule, are so well equipped that they can make immediate shipments on receipt of orders. The best way for a foreign merchant to order is through his regular buying agent in New York. When placing an order for a certain make of car in this way the merchant should also write to the manufacturer, advising him that he has done so.



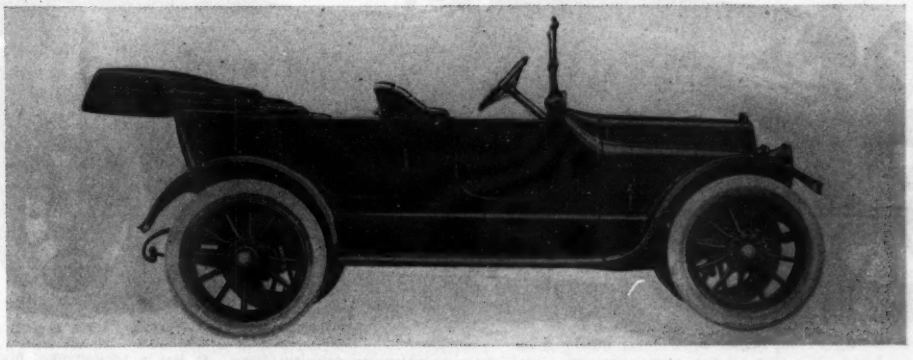
Moline-Knight roadster mounted on same chassis as touring car; 50-horsepower, 128-inch wheelbase, electrically equipped

In writing to his buying agent or to an American automobile manufacturer, the dealer abroad will save much time if he will explain as clearly and fully as possible in regard to the requirements of his market; the kinds of cars he thinks will sell best there, and whatever else is likely to be of mutual interest. Only in this way will the merchant be able to secure the fullest co-operation and the most satisfactory results.

In this connection it is well for the merchant abroad to bear in mind that the United States is one of the world's greatest manufacturers of motorcycles and of commercial motor vehicles. In the mechanical development of both of these classes of machines the physical characteristics of the country and the ingenuity and skill of American inventors have played as important a part as in the evolution of the motor car for other purposes.

For individual touring the motorcycle long ago supplanted the footpower bicycle. Indeed the motorcycle of to-day is not much more expensive than the high-grade bicycle was ten or fifteen years ago, while the range of its usefulness is many times greater. The motorcycle's rates of speed, which are controlled instantly by the rider at all times, vary greatly. One can go as fast or as slow as one likes. All paths, even the narrowest, are roads for the motorcyclist, and he can ride swiftly where the four-wheeled auto cannot follow.

A line of motorcycles should be carried by every automobile agent. They can be readily adapted to carrying two passengers, and there are various attachments which enable them to be used for commercial purposes, such as the delivery of light packages of some bulk. In fact, in all large American cities, many large commercial establishments, both wholesale and retail, have large numbers of motorcycles for distributing packages. They have found them cheaper and far more efficient than anything else for light delivery service. This is especially the case in such lines as laundry, haberdashery, dry goods, hats, shoes, clothing, etc.

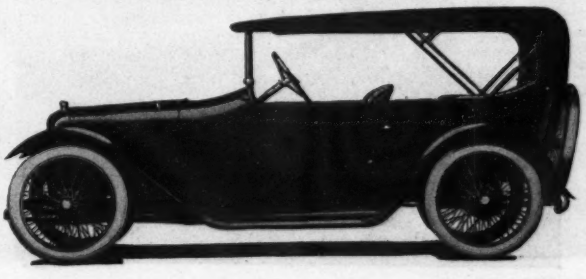


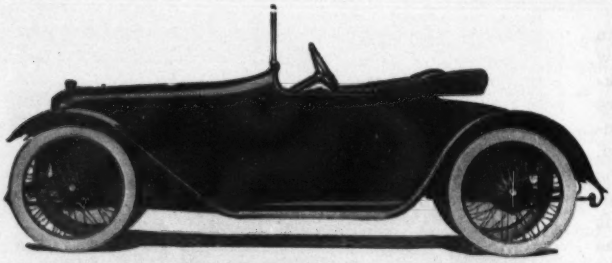
Overland Model 81T, five-passenger touring car. This is a 4-cylinder car, the cylinders being cast singly. Other features are: 30-horsepower; wheelbase, 106 inches; full streamline body; floating type rear axle; electric starting and lighting equipment; left-hand drive; finish, Brewster green with ivory striping

Whether employed in the city, the suburban town, or in the country, the motorcycle increases the selling radius of the person or firm that uses it. Even the dealer in motor vehicles finds the motorcycle a valuable aid. When trade shows signs of slackening, the automobile agent sends out one or more of his selling staff to canvass the surrounding country for new prospects, almost invariably with very satisfactory results.

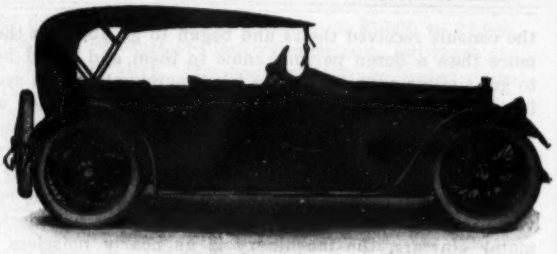
Not only in the more thickly settled portions of the United States but in remote country districts the motor truck and other types of the four-wheeled commercial vehicle have become indispensible. Where towns and

Four-passenger Sedan touring car, with staggered spoke wheels, made by the C. J. Fischer Company





A handsome two-passenger Fischer car, electrically started and lighted, 104-inch wheelbase, water cooled motor

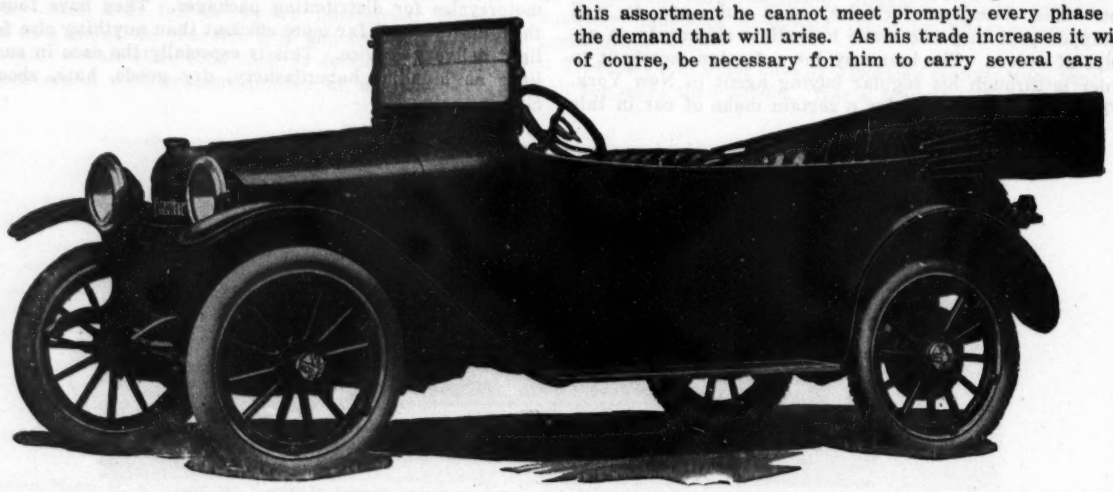


The 1915 Pullman model 6-48, with 134-inch wheel base, larger body and optional electric gear shift

houses and railways are far apart the commercial car fills the gap between animal and steam power. It has been observed in the United States that the introduction of the first motor vehicle in a new region is invariably followed by many others. All that is necessary is to show the practical advantages of this form of transportation.

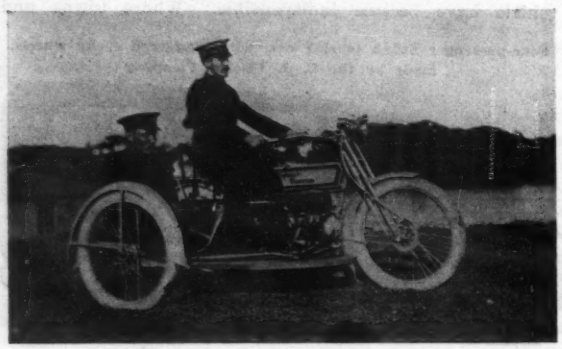
There are almost as many types of commercial vehicles made in the United States as there are of motor cars for less utilitarian purposes. They are in every conceivable employment—new uses are being found for them every day, and new mechanical adaptations are made continually to meet them. All that is necessary is for the automobile dealer abroad to tell what his local conditions are and the manufacturer in the United States can inform him how to meet them. Practically every American manufacturer of motor trucks and commercial vehicles has in his employ a staff of traffic experts whose business it is to study and solve every problem that is presented to them. In most cases it is not at all necessary that they shall visit the field personally. Out of their long experience they submit a list of questions from the answers to which they can gather the requisite information. Then they are able to state to the inquirer exactly the kind of vehicle that is best adapted to meet the particular needs most efficiently and economically. This service, of course, is rendered without charge.

The automobile agency that pays is the one where those in charge are continually studying the immediate and possible transportation needs of the community. The successful automobile agent never waits for business to come to him—he goes after it and creates it, or stimulates its growth. To do this properly he must carry in stock from the very beginning at least one of each type of the various classes of motor vehicles for which he is agent. Without this assortment he cannot meet promptly every phase of the demand that will arise. As his trade increases it will, of course, be necessary for him to carry several cars of each class, and if he is far away in time of transit from the factory, he should have as many more—practically a duplicate assortment—on the way to him. One peculiar characteristic of the buyer of an automobile is that he usually makes up his mind all of a sudden that he wants a machine. Then he wants it immediately. He cannot wait. Generally he will pay even a little more for a machine from stock than for one that he will have to wait two or three months for.

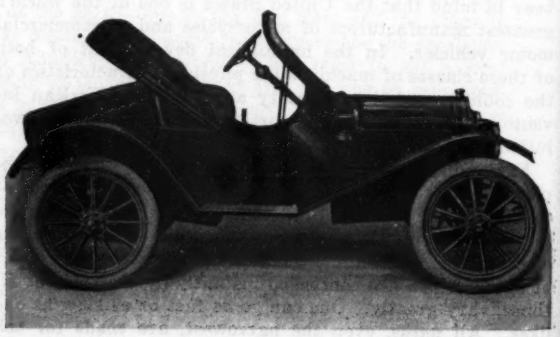


The "New Detroiter," made by the Briggs-Detroiter Company, has exceptionally graceful lines. It has a long-stroke, high-speed motor, ball bearing throughout, that develops 32-horsepower under ordinary driving conditions

A Harley-Davidson motorcycle, with Maxim gun on sidecar chassis, going abroad with 90th Reg., Canadian militia



The Metz "Twenty-two": a car with gearless transmission and 4-cylinder, water-cooled motor



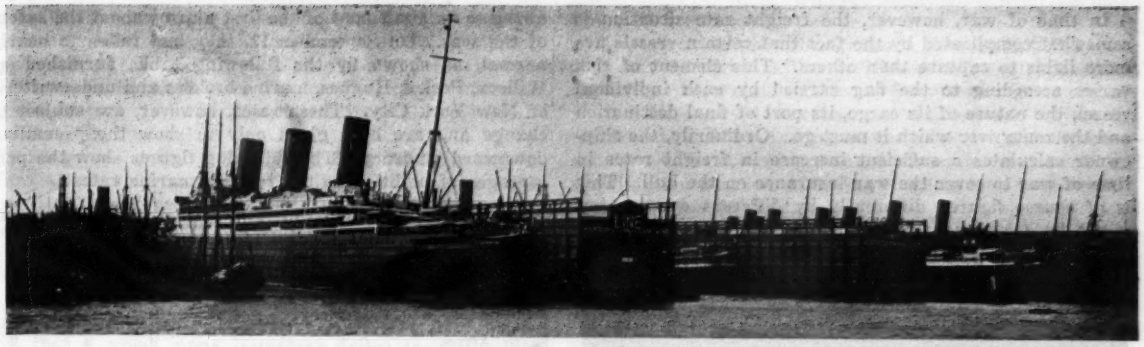


Photo by Edwin Levick.

Steamers of the North German Lloyd and Hamburg-American Lines tied up at their piers on account of the European war

THE RESUMPTION OF THE WORLD'S OCEAN SHIPPING

After a Suspension of Activities Due to the War, Unparalleled in Maritime History, Merchant Fleets are Now Moving Once More

BEGINNING in June, 1909, the world's fleet of ocean carriers has been increased at a more rapid pace than ever before, all records of tonnages under construction at the leading shipyards of the United Kingdom and on the Continent being successively surpassed year by year until very recently. Naturally, this excessive activity of the shipbuilders resulted eventually in an oversupply and the shipping trade consequently experienced one of the periods of depression that regularly alternate with periods of extreme prosperity in that most volatile of all branches of commerce. None the less, few if any ships were withdrawn from the seas as a result of this depression and August 1 found the world possessed of by far the largest fleet of ocean passenger and freight carriers in its history.

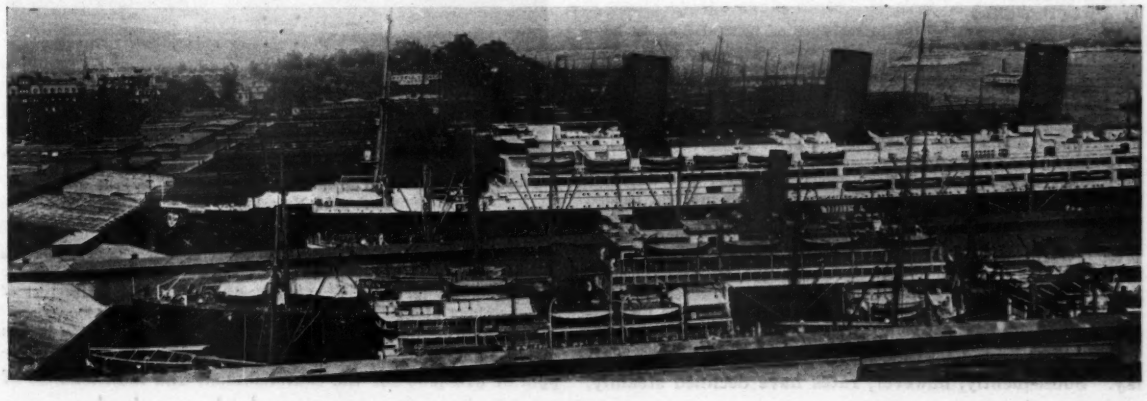
When the declaration of war compelled Germany's great merchant fleet to hasten to the nearest home or neutral ports the withdrawal of this great amount of tonnage naturally disorganized the shipping industry in every part of the world, while owners of vessels flying other flags were compelled, as a matter of precaution, to cancel their sailings for a short period owing to the many uncertainties of the situation. The result was a temporary cessation of shipping activity throughout the entire world without parallel in the history of steam navigation.

Obviously, such a situation could not long exist and within a very few days some of the cancelled sailings began to be restored. Progress in this direction, which was at first somewhat desultory and uncertain, has during the last two weeks become so pronounced that it can be safely stated that there is to-day sufficient tonnage available, on formally advertised sailings, to take care of all the foreign freight and passenger business now in sight at New York and other leading American ports. This has already resulted in a gradual resumption of both outward and incoming traffic and gives American exporters and foreign importers assurance that the commerce between the United States and the neutral nations throughout the world, and even that with some of those actually at war, can now go on as usual.

An element in the situation that retarded the resumption of trans-oceanic shipments even more than the temporary withdrawal of sailings was the sharp rise in ocean freights resulting from the unprecedented conditions created by a war in which so many of the leading ship-owning nations were engaged. In some instances the increase in rates amounted to as much as 150 per cent. over those prevailing in normal times, while in the majority of cases the advance asked by the steamship companies was 50 per cent. Theoretically, ocean freight rates are governed by the law of supply and demand, which in this case works more directly and promptly than in any other class of mercantile transactions. If more tonnage is available at a given port than there is freight to be carried, freight rates invariably tend to fall, and if the excess of tonnage is considerable the fall is usually very sharp and sudden. On the other hand, when there is a scarcity of available tonnage, rates rise as high as the traffic will bear, but this condition tends quickly to rectify itself, inasmuch as ship-owners can speedily call other vessels to secure a share of the traffic offered at such exceptional rates and, as these arrive, the freight rates naturally fall to a more normal level.

Another view across the German line piers at Hoboken, showing two or three transatlantic liners berthed together in each slip

Photo by Edwin Levick.



In time of war, however, the freight rate situation is somewhat complicated by the fact that certain vessels are more liable to capture than others. This element of risk varies according to the flag carried by each individual vessel, the nature of its cargo, its port of final destination and the route over which it must go. Ordinarily, the shipowner calculates a sufficient increase in freight rates in time of war to cover the war insurance on the hull. This is of course figured differently by different owners, but might be stated as approximately covered by a flat increase of 25 to 33 1-3 per cent. in most cases. The fact that many rates were temporarily advanced to a much

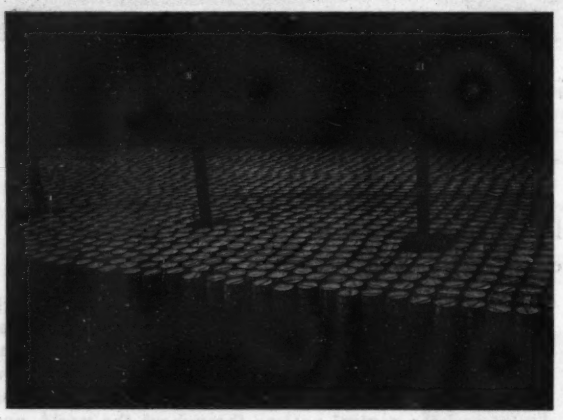


Photo by Edwin Levick.

Interior of Hamburg-American Line pier, showing thousands of barrels of cement awaiting export shipment

higher figure is accounted for by the law of supply and demand above mentioned, and these exceptional rates are already beginning to be reduced as conditions tend to become more normal in this respect.

Another factor that has retarded export operations since the outbreak of the war is the sharp rise in war risk marine insurance. In this, as in the case of freight rates, the basis is the schedule in effect in normal times, while the war rate is the percentage of increase. This may vary from 5 per cent. to 100 per cent., according to the flag the boat sails under, the nature of the shipment, its destination, the state of the seas over which it must pass and so on. For a time the rates of war risk insurance rose to a point that made shipping practically impossible, but reductions have since been made and the general tendency is at present downward in all lines.

The following valuable summary of the scope of war risk insurance was prepared for the New York Chamber of Commerce and is here reproduced as being of interest, at this time, to importers as well as shippers:

"1. The cargo may be sunk with the ship, or condemned by the prize court of the captor as enemy's goods or as contraband.

"The loss is not covered by a marine policy, but would be covered by a war risk policy.

"2. The goods may be lost or damaged by reason of the ship striking a mine or otherwise coming within range of hostilities.

"The loss is not covered by a marine policy, but would be covered by a war risk policy.

"3. Goods released by the prize court as neutral may be damaged in the course of unloading, storage or reloading.

"Losses of this nature would not be covered by a marine policy, but would be covered by a war risk policy.

"4. Extra charges and expenses in connection with forwarding released goods from the port of the prize court to their original destination would not be covered by a marine policy, but would be covered by a war risk policy.

"5. The owner of the released goods may suffer loss due to a deterioration in the quality of goods owing to their inherent nature, a depreciation in price, a loss of market, or a loss of interest in consequence of delay in obtaining the release of his goods by the prize court.

"Such losses are not covered either by the ordinary form of marine policy or by a war risk policy."

On the outbreak of the war in Europe insurance on vessels rose immediately to unheard of figures, owing to the large number of risks that had to be covered without delay. Subsequently, however, rates have declined steadily, owing to an abatement of the first alarms about the safety of the seas. On September 11, they had fallen to nearly normal, as shown by the following table, furnished by Willcox, Peck & Hughes, marine brokers and underwriters, of New York City. These rates, however, are subject to change and are here given only to show the prevailing downward tendency. The following figures show the percentages of addition to the regular marine rates:

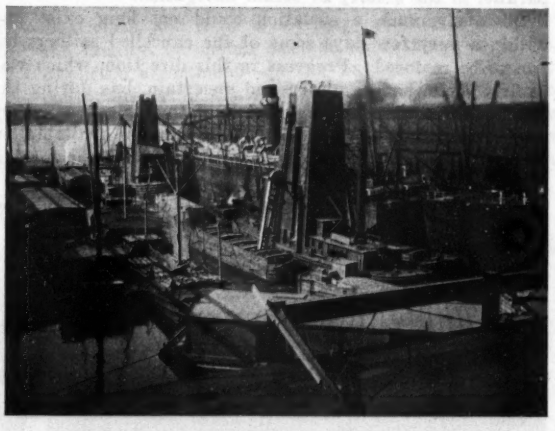
	American flags.	Other neutrals.	British flags.
United Kingdom, West Coast, but including London and Havre (passenger steamers)	¾	1	1
All others	1	1½	2
United Kingdom, East Coast (pass. stmrs.)	3	3	3
Norway	0	1	2
Mediteranean and East Sicily	0	1½	2
Holland	3½	3½	2½
South Africa	0	2	2
South America, via Magellan Straits	½	1½	3½
South America, via Panama Canal	½	1	2
Australia and New Zealand, via Suez	1	1½	2½
Manila and Far East, via Suez	0	2	2½
Manila and Far East, via Panama Canal and Pacific	0	2	2½
Porto Rico	½	¾	1½
Cuba	¼	¾	1½

A bill to authorize the establishment of a Bureau of War Risk Insurance in the Treasury Department of the Federal Government of the United States has been passed by Congress and became effective from the date of its passage. The measure provides that the Bureau shall be abolished within two years. The more important clauses of this bill are as follows:

"Section 2.—That the said Bureau of War Risk Insurance, subject to the general direction of the Secretary of the Treasury, shall, as soon as practicable, make provisions for the insurance, by the United States, of American vessels, their freight and passage moneys, and cargoes shipped or to be shipped therein, against loss or damage by the risks of war, whenever it shall appear to the Secretary that American vessels, shippers, or importers in American vessels are unable in any trade to secure adequate war risk insurance on reasonable terms.

"Section 5.—That the Secretary of the Treasury is authorized to establish an advisory board, to consist of three members skilled in the practices of war risk insurance, for the purpose of assisting the Bureau of War Risk Insurance in fixing rates of premium and in adjustment of claims for losses, and generally in carrying out the purposes of this act; the compensation of the members of said board to be determined by the Secretary of the Treasury, but not to exceed $25 per day. In the event of disagreement as to the claim for losses, or amount thereof, between the said bureau and the parties to such contract of insurance, an action on the claim may be brought against the United States in the District Court of the United States, sitting in admiralty, in the district in which the claimant or his agent may reside.

"Section 6.—That the Director of the Bureau of War Risk Insurance, upon the adjustment of any claims for losses in respect of which no action shall have been begun, shall, on approval of the Secretary of the Treasury, promptly pay such claim for losses



Fleet of lighters and grain elevators loading freight steamers at New York

to the party in interest; and the Secretary of the Treasury is directed to make provision for the speedy adjustment of claims for losses and also for the prompt notification of parties in interest of the decisions of the bureau on their claims."

The sum of $5,000,000 is appropriated for paying losses accruing under the provisions of this act, and the further sum of $100,000 for the establishment and maintenance of

the Bureau. While this emergency measure is not expected by shipping men to have much effect on war risk insurance rates in general, inasmuch as its provisions apply only to American vessels and their cargoes, it has had a most important bearing on the applications for American registry under the ship registry bill referred to elsewhere in this article.

During the month of September several of the famous trans-Atlantic flyers resumed sailings, while lines from American ports to a great many parts of the world restored sailing schedules to practically their normal condition, for this season of the year. This has already resulted in a marked improvement in the foreign mail service in both directions. During the month of August incoming mails were exceedingly irregular and meagre, with the result that a great many importers failed to receive the necessary shipping documents to enable them to withdraw from the Custom House merchandise which had actually arrived. In order to obtain possession of such merchandise bonds had to be given to the Collector of Customs and, while checks for this purpose were returned as soon as the documents arrived, there was naturally considerable trouble and delay. General commercial correspondence of all kinds was also very much retarded during this period and many large houses that in normal times kept numerous clerks employed handling their foreign mail had little or nothing for them to do for the time being. The faster boats for those employed immediately after the outbreak of hostilities.

As regards outward foreign mails there have at no time been any countries in the world to which mails were not regularly dispatched, although those sent to countries within the zone of war have naturally been subject to more or less delay and uncertainty as to their ultimate delivery. The following summary may be of interest as showing the situation regarding outgoing mail to countries within the zone of war:

UNITED KINGDOM.—Going out as usual, except for changes in ports (Liverpool being substituted for Channel ports) and in steamers employed.
FRANCE.—Via Liverpool at first, but since August 26, there have been sailings from New York direct to France.
BELGIUM.—As usual, via England, as Belgian mail has never been sent direct, except parcel post.
GERMANY.—Via Italy, Netherlands and Norway. The 2-cent letters for Germany are, as exceptional measure, being forwarded the same as the Postal Union rate letters.
AUSTRIA.—Via Italy.
SERVIA.—Via the United Kingdom.
NETHERLANDS.—Via the United Kingdom and direct to Rotterdam, the latter service being new.
RUSSIA.—Via the United Kingdom and Norway.
DENMARK.—Via the United Kingdom and direct.
NORWAY.—Via the United Kingdom and direct.
SWEDEN.—Via the United Kingdom and direct.

With one exception mails to all countries throughout the world, other than those enumerated above, are being forwarded over the customary routes, although in many instances by vessels of different lines from those formerly

Courtesy Bush Terminal Co.

General view of the Bush terminals in South Brooklyn, taken from a balloon and showing several steamers berthed at each of the 1200-foot piers, and model factory loft buildings in distance

post offices of the United States and Great Britain made extraordinary efforts to meet the emergency, however, and an interesting illustration of the chaotic condition of the mails was furnished by the S. S. *Royal George*, which brought 1,226 sacks of mail from Avonmouth via Quebec. This mail reached New York City by rail August 19, and contained letters from the following widely scattered countries:

BELGIUM,	ITALY,
BEIRUT (Asiatic Turkey),	NETHERLANDS,
CAPE VERDE ISLANDS,	NORWAY,
CRETE,	PARAGUAY,
FRANCE,	PORTUGAL,
GIBRALTAR,	SOUTH AMERICA,
GREAT BRITAIN,	SERVIA,
GREECE,	SPAIN,
IRELAND,	TRIPOLI.

At present the incoming mails from all parts of the world, except countries within the zone of war, are being received with normal regularity, although considerable improvement is still anticipated by the substitution of employed. The one change is the Trans-Siberian Railway Route to the Far East. While this is the quickest route to China, and is frequently designated on letters destined for points in that country, it can only be reached through Germany. All Far Eastern mails are now being sent via Pacific ports and mails for points on the Siberian Railway are going by the same route. It may be added that mail from England originally marked "via Siberia" has had this crossed out and "via United States" substituted, presumably by the British postal authorities.

All mails abroad are subject to more or less delay owing to the temporary discontinuance of sailings by some lines, but the situation in this respect has very much improved during the last few days and at present all mails are going out with reasonable promptness, and to points in Latin-America, Australia, New Zealand and the Orient mails are going forward substantially as usual. The British Post-office Department has officially stated that it can handle everything ordinarily forwarded via the United Kingdom, except to Germany and Austria-Hungary.

Obviously in the region of actual hostilities local mail service is undoubtedly disarranged. The Post Office De-

partment, however, is accepting and forwarding mails even for these points.

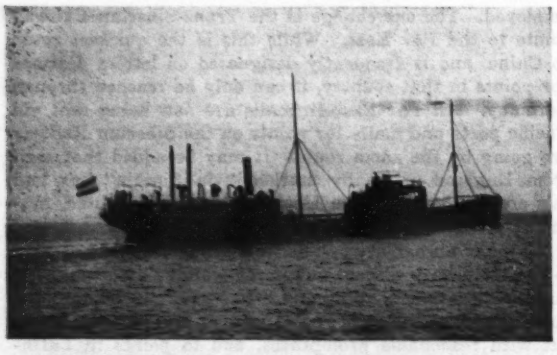
Many firms having an extensive foreign correspondence have made it a practice to send a duplicate of every important letter mailed abroad. This duplicate is held for a few days and forwarded by a later steamer, or if mailed at the same time as the original, is carefully marked so as to insure its being sent by another steamer or over a different route. It would be wise at present for all importers throughout the world to follow this example for the present, particularly with respect to letters of importance.

Courtesy Bush Terminal Co.

Freight yard at Bush Terminal, showing freight delivered direct from interior points to steamship piers

Registered mail from the United States to foreign points goes the same as ordinary mail so that the foregoing remarks apply to it. No international money orders are at present issued to Belgium, Austria and Egypt, and there are a number of other countries to which money orders cannot always be issued, just at present, owing to fluctuations in the rate of exchange. Second-class mail is going out as usual. Parcel post with Germany and France has been suspended, while to Belgium and some other countries within the zone of war parcels are forwarded via Great Britain, to be reforwarded as opportunity offers. To all countries outside of the zone of war, having parcel post relations with the United States, parcels are being forwarded as usual, except for the steamers employed.

The foregoing facts are given in some detail in order to enable importers to see for themselves that, in spite of the very unusual conditions now existing, there is every reason to believe that they can transact business with the United States as promptly as heretofore, as far as shipping and mail facilities are concerned.



One of the latest types of cargo steamers to arrive at New York

The month of August witnessed many extraordinary incidents in the general international shipping situation. For a time the most traveled roads of the sea were deserted by all except ships of war. Practically every merchant vessel made haste to reach the nearest neutral or home port, but some were not successful in evading capture.

In the last days of August the number of steamers lying idle or being detained in the port of New York attained its maximum. On the 28th of that month there were counted in that harbor 161 steamers, the majority being cargo boats, and among them ships of every flag.

Since then practically all these ships—except those of German or Austrian registry—have gone their accustomed ways, or are preparing to do so. There are still 35 or more German boats tied up at New York's docks. Most

Courtesy Bush Terminal Co.

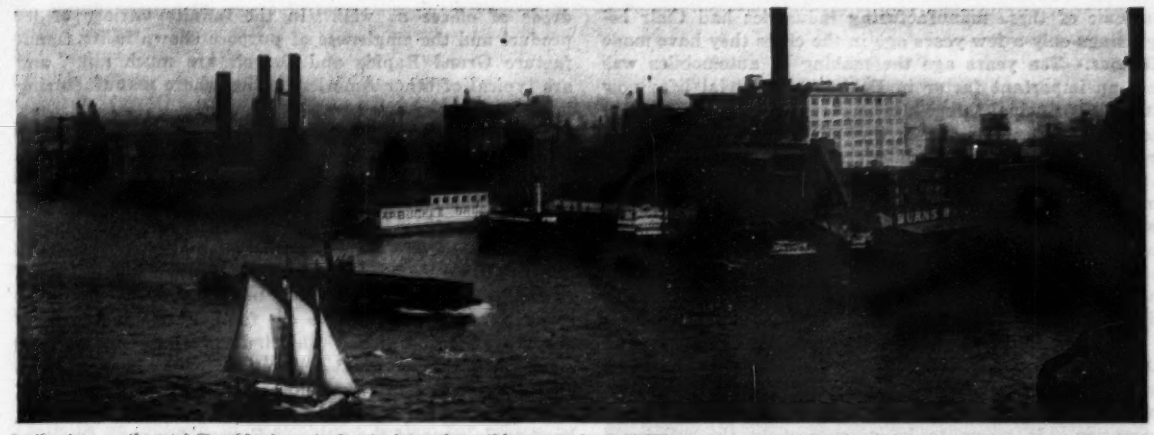
One of the seven covered piers at Bush Terminal, showing railroad cars delivering and receiving freight

of these are passenger liners. The Hamburg-American has a dozen, including the *President Grant, President Lincoln, Prinz Eitel Friedrich, Prinz August Wilhelm, Prinz Joachim,* and the giant *Vaterland.* The North German Lloyd has several more, including the *Barbarossa, Friedrich der Grosse, George Washington, Grosser Kurfurst and Prinzess Irene.* There are about ten other German ships, with nearly 53,000 total tonnage, still in the harbor. The Austro-American Line's vessels detained in New York include the *Martha Washington* and three others.

British, French and Italian boats, both freight and passenger, are loading and sailing for most of the world's ports with practically normal regularity. The North Atlantic lanes, apparently, are being systematically patrolled by British war vessels. The captains of incoming vessels state that from the time they leave their ports on the other side until they are safe within the three-mile limit off the North American coast they are passed along by wireless from one British man-of-war to the next. They seldom see these patrols, but judge from the strength of the wire-

Congestion of traffic on West Street, North River, showing methods of shipping merchandise, now passing away

less messages from them that they are rarely more than 50 miles away. If, by any chance, these merchant ships should be threatened with attack, they are instructed to send out a wireless call at once and are assured that help will come almost immediately.



In the two sections of Brooklyn's waterfront pictured on this page about 50,000 persons are employed. This view shows part of the plant of the E. W. Bliss Company, manufacturers of heavy machinery and projectiles; the great Arbuckle sugar refinery, and other large industries

WHAT THE MILLIONS OF WORKERS IN THE UNITED STATES ARE MAKING

The Great Volume and Variety of Products that American Mills and Factories Offer to Foreign Buyers—Cities where Manufacturing is Specialized

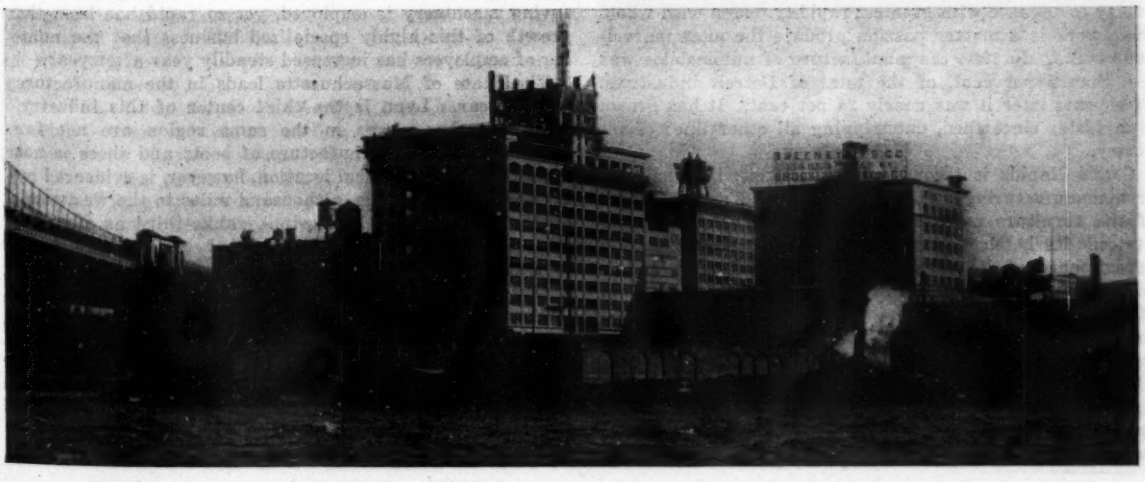
WHILE millions of men across the Atlantic are destroying the constructive work of generations, the cities, fields and factories of the United States are crowded with busy life.

In the variety and volume of its products the United States has much to offer in every line. As in the Old World, certain industries have centered in certain cities. In America, however, manufacturing gravitated to certain local points in the beginning because of the proximity of great sources of supply of raw materials, such as coal and iron. These determining factors in location later were influenced by the abundance of the supply of labor, which is quite as great an essential. Then came the development of the great systems of transportation which linked the two and made them invincible. While the great industrial cities of the United States are relatively farther apart than those of Europe, they are quite as convenient of access.

There are many of these cities and groups of cities in which manufacturing is more or less specialized. In Detroit, for example, the principal industrial product is automobiles; in Grand Rapids it is furniture; in Troy it is collars and cuffs and shirts; in Pittsburgh, steel; in Paterson, silks; in Lynn, boots and shoes, and so on. These are typical centers of great manufacturing industries, although automobiles and furniture, shirts and steel, silks and shoes are all made elsewhere in widely separated cities and in great quantities. But the cities whose names are oftenest linked with their specialized products are the best known, and may be taken as typical of the others that may rank almost as high in the volume of their output.

In addition to these purely manufacturing cities there are the still larger centers of population that are dominant in manufacturing in many lines, but are even greater centers of commerce and distribution. Such big cities as New York, Chicago, Philadelphia and Boston are of this class. Each of them is the leader in America in many classes of manufacture, but their greatness in this respect is obscured by their growth in other directions. The specialist city, where the work is concentrated, is more interesting, however, for the same reason that the charge of a brigade that can be viewed as a whole is more exciting than the forward movement of an army of which little can be seen at a time.

The group of reinforced concrete buildings in the foreground, covering more than two city blocks and having 38 acres of floor space, are occupied by the Robert Gair Company, makers of paper goods. The Sweeney Manufacturing Company, whose plant is also shown, make copper and brass ware



Some of these manufacturing industries had their beginnings only a few years ago in the cities they have made famous. Ten years ago the making of automobiles was not an important factor in Detroit's industrial life; now it is the principal thing. Its importance is apparent even to the traveler who passes through Detroit by rail. He glimpses from the car window at streets thronged with traffic, but with not a horse-drawn vehicle in sight. Automobiles are everywhere—passenger cars, light delivery wagons, motor trucks, motorcycles. The great factories where they are made are conspicuous landmarks. No small part of the America's industrial army is engaged here in the motor vehicle industry and the minor industries related to it.

Mingling with the people in the hotels, the restaurants, the clubs and other places of popular resort the character of the city's activity becomes even more strikingly apparent. The automobile is the absorbing topic of conversation. It seems to be uppermost in the minds of everyone. Every phase of it, from speed to spark plugs, is of the most intense interest.

It is this concentration of effort and ideas that everywhere and in every time has caused invention and industry to advance with greatest rapidity. Men with whom their work is a master passion produce the most marvelous results. In 1904 the manufacture of automobiles was less than 5 per cent. of the total of Detroit industries. Five years later it was nearly 24 per cent. It has grown even faster since then, outstripping all other lines of industry.

Grand Rapids is second only to Detroit, in Michigan, as a manufacturing city. It is recognized as the center of the furniture manufacturing industry in the United States. Its hotels and wholesale houses and the selling departments of its factories are thronged from year's end to year's end with furniture buyers from every part of the United States, and from most parts of the civilized world as well. Everyone is thinking and talking about furniture. Grand Rapids itself is a clean, up-to-date city. The visitor's first impression of it is that of a big modern house filled with new furniture, immaculate and shining. But Grand Rapids makes enough furniture every day to furnish many hundreds of new houses and many hundreds of offices as well. In the infinite variety of its product and the singleness of purpose shown in its manufacture Grand Rapids and Detroit are much alike, and are typical of other American cities where manufacturing is so much specialized.

Further eastward, about 150 miles up the Hudson River from New York, is Troy, where another division of America's industrial army, numbering tens of thousands, is employed in the making of collars and cuffs and shirts. This industry has been established there for many years, and has grown steadily. Not only are most of these lines that are demanded by the United States' market supplied from these great factories in Troy, but they are also widely exported. Their trademarks are familiar in haberdashers' shops around the globe. This industry has been so long established that a great community of trained workers especially skilled in this industry has grown up and has become relatively as important as the famous guilds that have made some of the cities of Europe famous. One section of these is employed in the manufacture of the articles, and another in washing and ironing and packing them for market. In every branch of the industry, from the fabric to the finished product, the most ingenious labor-saving machinery is employed, yet so rapid has been the growth of this highly specialized business that the number of employees has increased steadily year after year.

A general view of the collar stitching department in the plant of the United Shirt & Collar Company, Troy, New York. More than half this city's entire working population is engaged in the manufacture of shirts, collars and cuffs

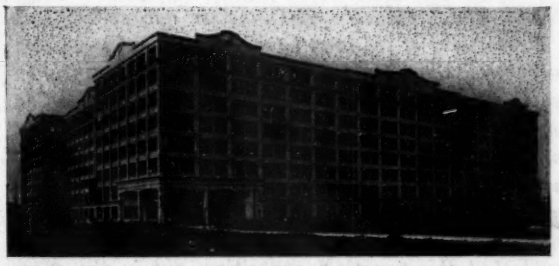
The State of Massachusetts leads in the manufacture of footwear. Lynn is the chief center of this industry, although other places in the same region are not far behind. That the manufacture of boots and shoes is not a matter of geographical location, however, is evidenced by the fact that St. Louis, a thousand miles to the westward, on the banks of the Mississippi, ranks third as a manufacturer of footwear. But Lynn has been in this business so long that its name is always associated with this industry.

About 100,000 persons are engaged in the Massachusetts factories devoted to the making of boots and shoes and to other things related thereto. Nearly one-fourth of these workers are employed in the great plants at Lynn. One of the most striking sights of an industrial city may be seen at the close of each working day in Lynn. Just before the whistles sound denoting the conclusion of labor

the streets around the great factories are almost deserted. A few moments later and they are crowded almost from curb to curb with thousands of men and women, hurrying to their homes. It is literally a human flood that seems to burst from the broad doorways of the big buildings; but, while one watches, it dwindles and disappears.

In no other industry is more intricate machinery employed than in the making of boots and shoes. Highly complicated but incredibly swift and sure mechanical devices fashion the footwear so rapidly that a person walking can hardly keep pace with its progress from one machine to the next in the course of the various processes that transform pieces of flat leather to the finished product. In fact one of the chief reasons for the surprising growth of this industry in recent years is the development of machine efficiency and the application of new methods, expert ability and service of the highest order to the great problems of shoe machinery and manufacturing. There is no process in shoemaking to-day for which a machine has not been perfected—and there are more than 300 different processes. The factories in the State of Massachusetts alone produce nearly 150,000,000 pairs of all kinds of footwear each year.

Boston is the commercial center of this industry. In that city are the executive offices of the shoe concerns or of their representatives; also that city is the center of the wholesale trade which supplies not only the domestic, but the foreign markets. Of late years especially the



Typical factory loft building, Bush Terminal, Brooklyn. On the land side it has railroad freight facilities and on the waterfront steamship docks

American shoe manufacturers have been steadily increasing their export trade. They have gone about this very systematically, in every case making a careful study of the requirements of each country before entering its markets.

Boston is also one of the great commercial centers of the United States for the cotton goods industry. Many of the great mill cities of New England, such as Lowell, Lawrence, Fall River and Manchester, find an export market for their products through Boston as well as through New York.

Pittsburgh, however, is quite another sort of city. There manufacturing is supreme. Vast deposits of iron and coal are at its door. It is at the junction of two important rivers which unite in the Ohio, a great waterway which leads to a greater, the Mississippi. To the Great Lakes on the north and to the ports of the Atlantic on the east run many lines of railroad.

The vast industries of Pittsburgh have been described so often and are so well known that they need no detailed mention here. In the mills and factories in and about that city one of the greatest divisions of America's army of workers is continually busy fashioning some of the most important of the basic commodities for the world's use.

Philadelphia stands first in the list of cities in the United States in its manufactures from raw materials. The annual product of its factories is valued at nearly a billion dollars. Nearly 300,000 workers are employed. To enumerate everything in which Philadelphia holds a leading or prominent place in making would take a very long and diversified list. Almost everything is manufactured there—from needles to locomotives, from buttons to clothing, from matches to furniture.

New York, in the aggregate value and in the diversity of its manufacturers, stands first among the cities of the United States. To attempt to enumerate even the industries in which the city is pre-eminent or to give detailed statistics of outputs would be more bewildering than informative. The city's area and its population are so

Detmer Woolen Company's sample department, Bush Terminal, Brooklyn. Abundant light and room are indispensable in the modern factory

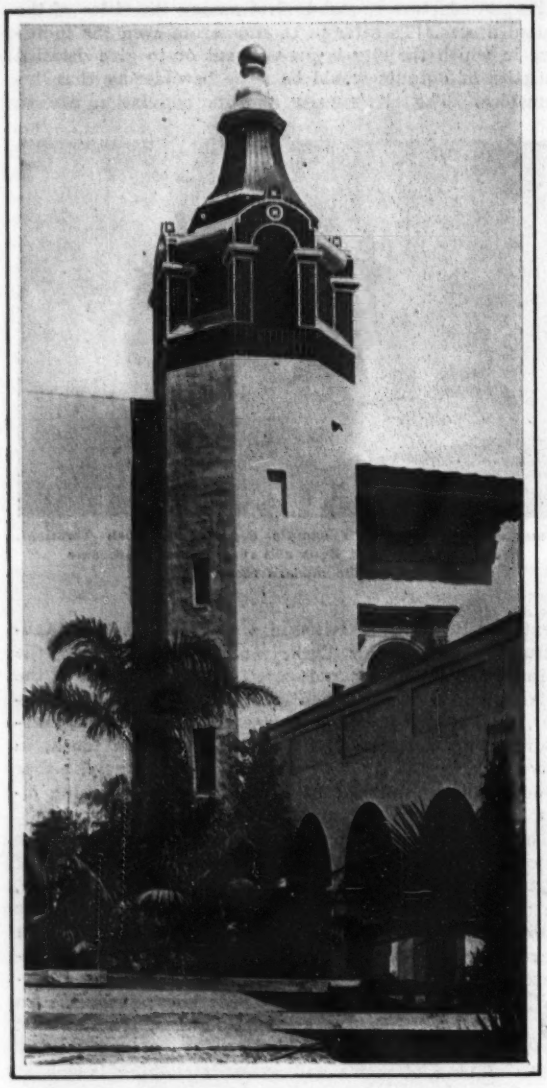
great and its other activities are so vast that the manufacturing side of New York is often overlooked by the visitor. It does not obtrude itself unless one goes to the districts where it is carried on. It is safe to say, however, that the buyer of any class of merchandise, commodity or raw material can speedily come in touch, in New York City, with its chief sources of supply, either through a representative of the industry or by going direct to the place of its manufacture.

There are more than a score of industries in New York City the value of whose annual products is in excess of $20,000,000. Among these are the refining of cane sugar, the smelting and refining of copper, men's and women's clothing, printing and publishing, slaughtering and meat packing, foundry and machine shop products, tobacco manufactures; millinery, lace and fur goods; paint and varnish, musical instruments, haberdashery; copper, tin and sheet iron products; artificial flowers, feathers and plumes; and confectionery.

The making of men's and women's clothing is one of

Loading platform and freight sidings, Bush Terminal. The cars are shunted from the immense floats on which they cross the harbor

the city's great industries; in it nearly 200,000 workers are employed. More than 50,000 persons are engaged on millinery and lace goods, and nearly as many are busy making artificial flowers and feathers and plumes; nearly 100,000 are engaged in tobacco manufacture, and so on. There are nearly a million workers regularly employed in all branches of New York City's industries.



SAN DIEGO—A NEW

SAN DIEGO'S perpetual mid-June climate has given it an opportunity of which it is taking advantage in its Panama-California Exposition which begins the first of next January and lasts a full year. It will be a new kind of fair—an exposition of processes, not of products. Machines and implements will be shown in action instead of being displayed in motionless array in one great hall after another.

Agricultural machinery, for example, will be exhibited in actual use in the cultivation of a large open area planted with different crops. Another division of this exhibit will be a small model farm that will show how a little tract of land can be cultivated intensively and be made to produce a competency—and even a profit—for a small family. Still another will be a citrus orchard, showing oranges, lemons and grapefruit growing in great variety, and the methods of cultivation by which the best results are attained. Still another striking exhibit will relate to tea culture, and will show growing tea plants imported from Ceylon under the care of Cingalese gardeners.

Exhibitions of this sort have a great fascination for everyone. Even the farmer of experience is likely to see in them much that is new and interesting. The amateur agriculturist and the city dweller who aspire to own and cultivate a bit of ground—and every normal person hears the call of the soil as middle age approaches—will find it even more attractive and instructive. Land shows and illustrated lectures are good; but this practical exposition, out in the open, under the brilliant California sunshine, can hardly be surpassed as a means of stimulating the back-to-the-land movement.

At left, tower of the Science and Education Building. View below: Arts and Crafts Building

TYPE OF WORLD'S FAIR

Still another lesson that the visitor will learn simply by looking is that modern machinery, modern chemistry and inventive genius have done away with much of the drudgery of the farm and have added immeasurably to the profits of agriculture when pursued as a business. There will be indoor expositions of processes also. These will deal with the household arts, and show how mechanical appliances can lighten domestic burdens in the kitchen, the sewing room and in every department of the home. Indoor and outdoor exhibits of this sort seem to be the best answers to the objections that arise in the minds of city people when thinking of leaving their urban homes and going to the country to live.

These are not the only agricultural phases of the San Diego Exposition. A vast amount of data has been compiled regarding the agricultural resources of the Western States. In a graphic way the area and the possible number of 40 and 320-acre farms, temperature variation, rainfall and irrigation supply, length of growing season, best crops, cost of operation and average value of product per crop, and the transportation facilities of each region are shown.

On the wall of each State building will be placed a contour map on a scale so large that it will show each community. Thus the prospective settler may examine the agricultural products exhibits, each of which has a key number referring to the State map. The key number to alfalfa, for instance, will show where it may be grown in a certain State, the distance to the nearest neighbors, schools, churches, highways and railroads.

The San Diego Exposition celebrates the opening of the Panama Canal, which also promises the opening

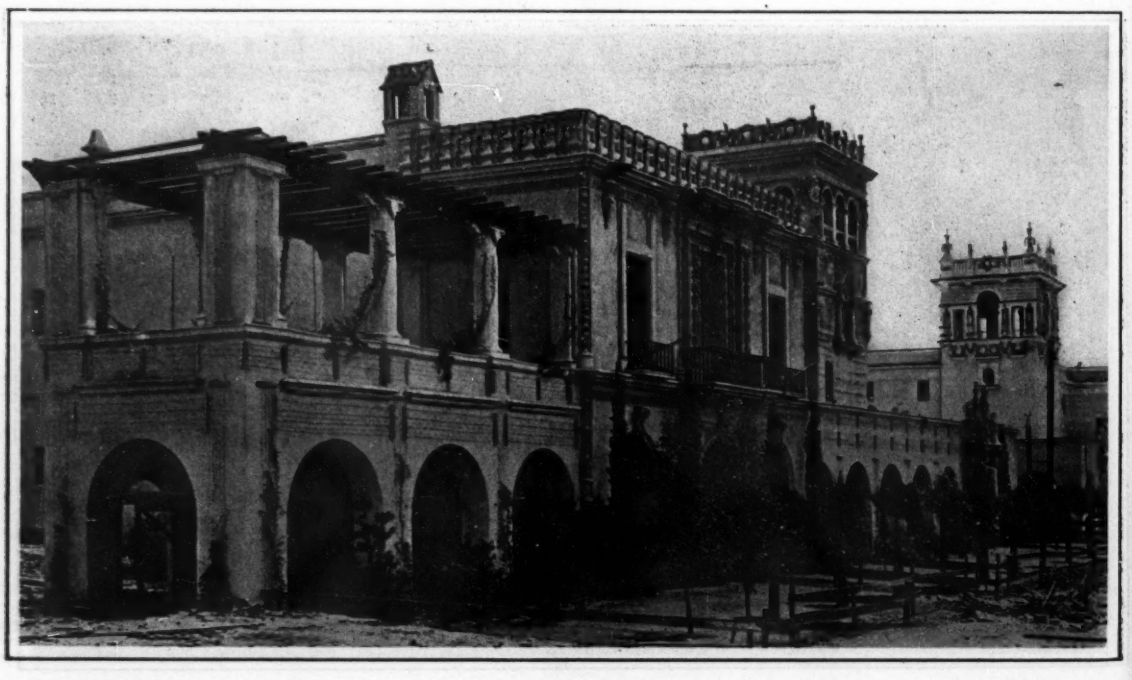
At right, patio of the Southern Counties of California Building. Below, an arcade in the same edifice

A corner of the model farm

of the Southwest. To show what this will mean statisticians have taken standard commodities from their point of origin to the eastern seaboard by rail, then by water to San Diego, then back by rail to the interior. Where the aggregate transportation rate met a like rate by all-rail transportation from the point of origin a line was drawn. All west and south of that line is considered country tributary to San Diego, for the reason that in that territory commodities can be obtained cheaper via San Diego than by any other route.

The exposition has been building for three years, and an amazing amount of work has been done in transforming the site into a rose-enclosed city which, with its domes and towers and ancient missions, looks like a city of Old Spain. The canyons are green with palm and cypress. The streets are lined with acacias; the quiet groves are soft with the drooping foliage of the pepper trees. Brilliant flowers climb over the walls and towers. Nature has given San Diego's Exposition a setting of climate and vegetation—bounded on one side by the mountains and on the other by the sea—that makes it a delight to the eye; and the intelligence and labor that has been expended on it give promise that it will prove to be one of the most interesting and instructive world's fairs ever held.

One side of the Home Economy Building



Courtesy of Wiard Plow Co.

Turning under a stubble field with a riding plow is far easier than walking behind a team all day

Courtesy of Parlin & Orendorff Co.

Three double gang plows cutting six furrows at a time, making plowing a pleasure instead of a drudgery

LABOR-SAVING MACHINERY ON THE MODERN FARM

How the Progressive Farmer Saves Money by Using Tools Specially Designed to Reduce the Amount of Manual Labor Required

THIS is the age of specialization, in agriculture as well as in the factory and shop, and if the farmer is to obtain the maximum of results on his investment and labor he must give as much attention to his tools and implements as does the manufacturer. In spite of the vast amount that has been said and written about the economy of using the improved implements that are now available, many farmers continue to plant and cultivate their crops in much the same way, and with the same tools, as they did a generation ago. To them a plow is a plow; it may be heavy or light, according to the purpose for which it is to be employed, but such differences in design as there may be seem to them a matter of little or no importance.

On the other hand, the progressive agriculturist is fully alive to the advantage of selecting his plow according to the soil in which it is to be used. He has learned that in heavy, sticky ground or sod the cast steel plow, with the long, slightly curved moldboard, will do by far the best and largest amount of work, because its shape and the material of which it is made insure perfect "scouring" qualities, and there is no necessity of stopping every few minutes to scrape off the earth. Besides that, it cuts through the ground, runs on an even bottom with only the touch of the hand to steady it, turns the soil perfectly and causes only the minimum strain on the animals pulling it. In contrast to this tool, the comparatively short plow with a more abrupt curve to the moldboard gives the most satisfaction in light or sandy soil, as its design tends to scatter and disintegrate the ground as it is turned over, the idea being to leave as few lumps as possible. Then there is the double moldboard plow, which is used between rows of corn, potatoes, sugar cane or other crops that have to be hilled up at certain stages of their growth. It can be pulled by a single horse or mule, and as it throws the earth up on both sides, the rows can be placed closer together than if the ordinary single moldboard cultivator plow was used.

No up-to-date farmer thinks of planting his crops by hand, for the implements now available for this purpose do so much better and more work that it is practically impossible to do without them if anything like the best results are expected. At the head probably stands the grain drill, which is used to sow wheat, rye, oats, grass, alfalfa and similar seeds. This machine opens a furrow to the required depth, drops the seed at regular intervals and then covers and presses down the ground. Aside from the great saving of seed, experience has proved that much greater yields are obtained when these drills are used, because the seed is sowed at a uniform depth and distance apart, whereas with the old style method of hand-sowing there are often considerable spaces where no seed at all has been planted, while in many others excessive crowding prevents the proper growth of the plants.

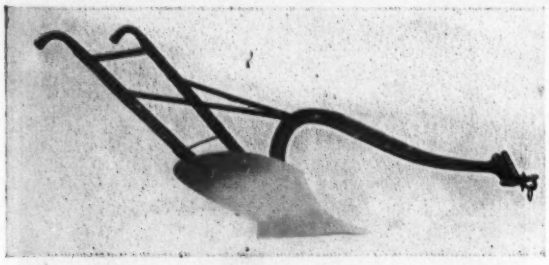
For many reasons the sulky or riding plow is rapidly displacing the walking plow, among them being the fact that the growing scarcity of farm help is resulting in more attention being given to make the work more attractive, by doing away with as much of the labor as possible. But

A disk seeder that does the work of eight or ten men sowing by hand and harrowing under

Courtesy of A. B. Farquhar & Co.

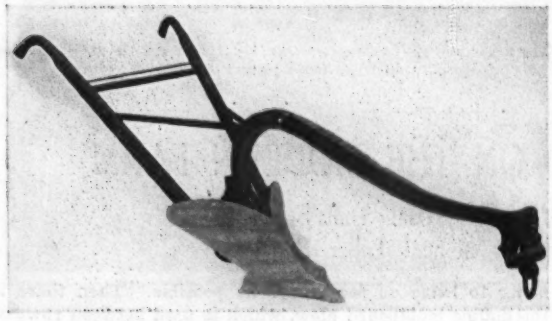
Breaking fallow ground with a riding plow. Doing this afoot in the old way drove many boys from the farm

Courtesy of Parlin & Orendorff Co.



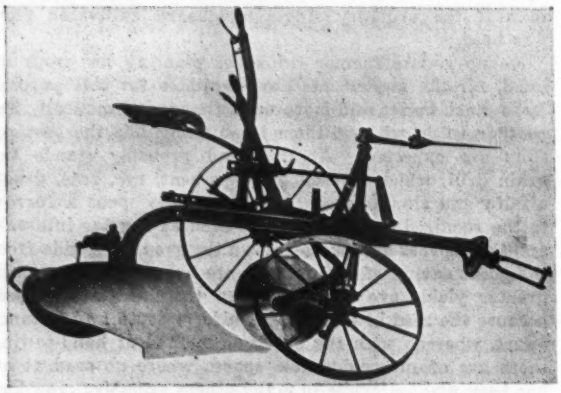
Courtesy of South Bend Chilled Plow Co.

A general purpose steel beam, single moldboard plow that is modelled on scientific lines



Courtesy of South Bend Chilled Plow Co.

Steel beam middle breaker plow that can be adjusted to any depth or soil and will work easily

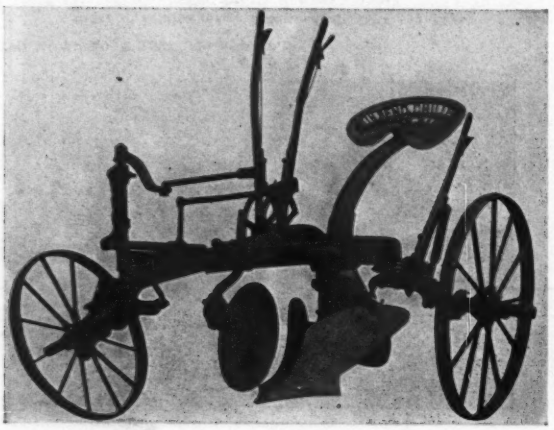


Courtesy of South Bend Chilled Plow Co.

A Pilot plow that is especially efficient in all kinds of difficult soils

A middle breaker of the sulky type that will go through the toughest sod or soil with ease

Courtesy of South Bend Chilled Plow Co.



in addition to making the plowing easier for the man, great economy can be effected with the sulky plow by using two or more bottoms, which enables one man to do two or three times as much work as he could do with a walking plow, the only added expense being the cost of the extra horses. When the fields have been previously well cultivated, as for instance in raising a crop of potatoes, it is not always necessary to plow the ground, the work being done at a great saving by means of a series of steel discs, which thoroughly prepare the ground for planting by turning it over to a depth of three or more inches. As these disc harrows, as they are termed, operate over a width of from four to eight feet with two or three horses they can do a great amount of work in a short time and are becoming steadily more popular. They are made in a great variety of styles and sizes, and are much used after the regular plow for cutting up heavy sods.

The corn and cotton planter is another device that has amply justified its existence and one that no farmer raising either of those crops can afford to do without. With it either crop can be planted in rows, which may be at any desired distance apart, or, by means of the addition of a simple and inexpensive attachment, in hills. Some of them are so arranged that the seed can be dropped either automatically, or by touching a lever with the hand or foot.

Large growers of potatoes find the cost of production much reduced when they use a combined planter and digger. One of these machines will open a furrow, drop the pieces of potato 12, 16 or 18 inches apart in a row and then cover them to a depth of 3 to 6 inches as may be desired, at the same time marking where the next furrow is to be opened. When digging the seed box is removed and a specially designed shovel substituted therefor, from the rear of which runs a series of parallel bars that lift the tubers from the ground and leave them on the surface, ready to be picked up. Some of the modern potato diggers are provided with attachments operated by a chain and gear that carry the potatoes directly into bags, thus saving a good deal of labor when these vegetables are grown on an extensive scale. All of these machines are operated by animal power and are arranged with seats for the driver, so that the potatoes may be planted or dug as fast as a horse can walk. There are special seeders to-day for about every seed that can be mentioned, so that it is really unnecessary to do this kind of work by hand.

Everyone knows that good crops cannot be grown without proper cultivation, and in order to lessen the cost as well as to eliminate as much as possible the tedious labor involved in this necessary task, the progressive agriculturist is depending more and more upon machinery. Of course, the hoe has not as yet been altogether discarded, but it is now used to only a fraction of the extent to which it was employed a generation or two ago. The horse-drawn riding cultivator has taken its place, and very satisfactorily, too. It is made in a great number of styles and will do excellent work on every kind of fruit or vegetable that is planted in rows or hills. This implement is provided with attachments in such variety that they can be used for cultivating the tender, delicate plant just breaking through the ground, or the full grown corn, cotton or potato. It can be regulated so as to merely scratch the surface of the ground or to turn over the soil to a depth of three or more inches, and to throw it either to or from the plant.

Another implement that is meeting with a good deal of favor among farmers is known as the stalk cutter. This device is intended to simplify and expedite the work of cleaning up a field in which corn, cotton or some similar plant has been grown. It is drawn by a team of horses or mules, and as fast as they can be driven it will cut off a double row of stalks close to the ground. The machines are very strongly built, and as the stroke is in the nature of a chop, the result cannot be otherwise than satisfactory. Those who have had to clean up a cotton or corn field by hand preparatory to plowing will readily appreciate the amount of labor and time that can be saved by one of these stalk cutters.

It may safely be said that every farmer who raises much hay has always disliked the work involved in harvesting this crop, the most strenuous of which is the loading of wagons in the fields, inasmuch as it is practically always done during that portion of the day when the heat is at its greatest height. This, no doubt, accounts for the popularity of the automatic hay loader. With one of these devices it is not necessary to rake the hay into piles, as it will take the hay from the ground just as it is cut. The machine is attached to the rear of the wagon to be loaded, and by means of a gearing attached to the wheels a series of rakes is passed over the ground, which gather up the hay as closely as would an ordinary rake, and lift it into the wagon. These loaders are usually eight feet wide, and as they pick up the hay as fast as the team can walk, it can be seen that the task of getting the hay into the barn has been rendered notably easier.

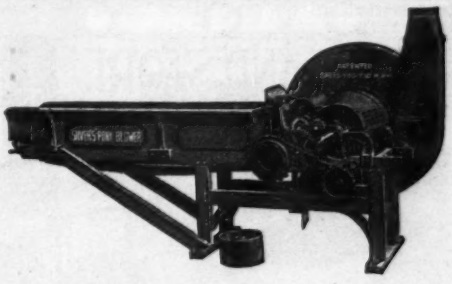
The time has long gone by since any intelligent farmer has neglected to use the manure that may accumulate on his place, although its distribution over his fields necessarily involves considerable labor, in consequence of its bulk and the exertion required in spreading it evenly over the ground. All this labor, however, has now been entirely eliminated by the automatic manure spreader. This machine consists of a wagon with an extra long body, on the floor of which is an apron moved towards the rear by a gearing on the wheels. At the rear of the body is an arrangement of revolving teeth that tear and disintegrate the manure as it is carried towards them by the moving apron. Thus the manure passing through these revolving teeth is torn apart and distributed on the ground over which the wagon is driven much more evenly and quickly than could possibly be done by hand. The loading of the wagon is the only manual labor involved.

Cutters and shredders are a necessity on every modern farm. They make the food for the cattle and poultry more palatable and reduce the waste. They are an important part of the labor-saving machinery, especially where the silage system is used.

There is a great variety of cutters and shredders. Some are for general, and some for specific purposes; some are for clover and other similar growths, and some for rough feed, such as cornstalks. Still others are especially designed for preparing ensilage. The smaller cutters and shredders are mostly driven by hand, but even with these one man can do the work of three or four chopping feed the old way. The smaller power-driven ensilage machines have a capacity of from three to four tons of ensilage per hour, and the larger several times that much. These machines save hand labor in every direction. They are equipped with a self-feeding device, and their output is elevated into the silo by a powerful blower or exhauster.

No farm is completely equipped without some kind of mechanical power, and the cheapest, simplest and most satisfactory way by which this can be provided is by means of some form of the gasoline or kerosene engine. These engines come in any size that may be desired, from the small affair developing less than a single horsepower to the large multiple cylinder outfit that can operate the heaviest machinery. A four or five horsepower engine, however, that can be purchased for about a hundred dollars, and costs only a few cents per day to operate, will meet the requirements of the average farm, and any farmer that installs one will be astonished at the number of purposes for which it can be used. With it he can obtain a supply of running water, can saw his wood, run his fanning mill, operate his churn and butter worker, grindstone, feedcutter, feed mill, silo filler, and do so many other things that he will wonder how he previously got along without it.

All of the machines and implements described and illustrated in this article are of course only representatives of the vast number of labor-saving devices that have been perfected in recent years for the purpose of aiding the intelligent and up-to-date farmer. Wherever there is a spirit of progress these progressive implements are in demand.



Courtesy of Silver Mfg. Co.

Pony blower silo filler for small 6 to 8-horsepower gasoline engines. The blower is replacing the conveyor

Courtesy of A. B. Farquhar & Co.

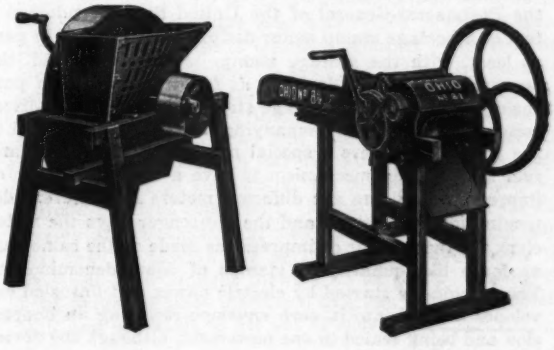
Digging potatoes by hand is back-breaking work. Getting them out with a machine like this is play

Courtesy of Parlin & Orendorff Co.

Stalk cutter in operation. It is used in clearing corn or cotton fields and saves time and money

At left, a rapid root cutter and pulper. Feed cutter for hand or power at right

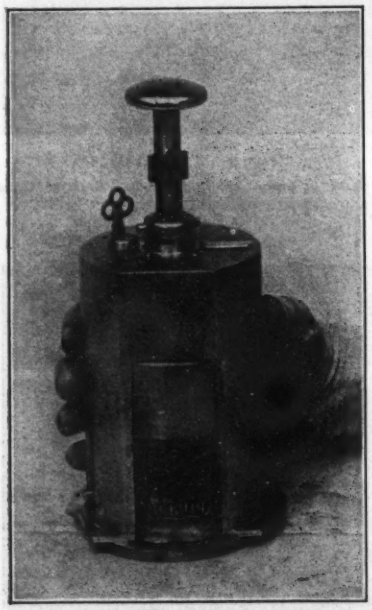
Courtesy of Silver Mfg. Co.



A PLAN FOR ELIMINATING POSTAGE STAMPS

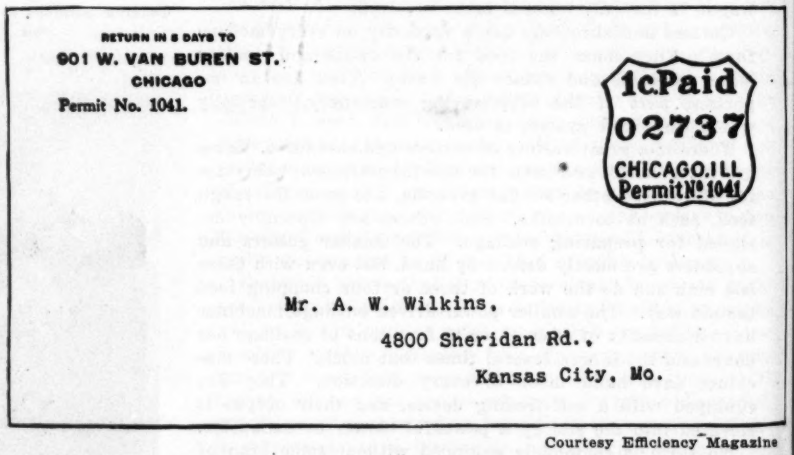
One of the Most Far-Reaching Efficiency Ideas Suggested in Recent Years

PRIOR to the invention of the adhesive postage stamp now so familiar to every part of the world, post office officials in the United States and Europe experimented for a time with stamping devices of various kinds. Among the rarest and most valuable treasures of the stamp collectors are several early issues of this kind, in which the name of the town or city and the amount of postage paid were stamped directly on the envelope. The instant and universal popularity of the adhesive postage stamp and the embossed or colored envelope stamp caused these early devices to be completely forgotten, and it is a somewhat curious fact that to-day—after more than three-quarters of a century—the advocates of efficiency in business management are going back to a device that is strongly reminiscent of these early steps in postal progress.



Courtesy Efficiency Magazine

New printing mechanism and register of postage meter for displacing stamps



Courtesy Efficiency Magazine

Facsimile of envelope stamps by means of a postage meter. It is claimed that this will work ten times as fast as it is possible to affix adhesive stamps

At Chicago, a short time ago a committee appointed by the Postmaster-General of the United States conducted a test of a postage stamp meter designed to do away, in part at least, with the postage stamp. Briefly described, the operation of the new device is as follows. Instead of purchasing a quantity of postage stamps the small cylindrical meter shown in the accompanying illustration is carried to the post office. Here a special meter clerk unlocks it and sets the printing mechanism to give a certain number of impressions. There are different meters for different denominations of postage and the messenger pays the meter clerk for the number of impressions made at the same rate as for a like quantity of stamps of equal denomination. The machine is started by electric power and unsealed envelopes are fed into it, each envelope receiving an impression and being sealed in one movement, although the device can be adjusted to seal without printing or print without sealing.

As the envelopes go through the machine each impression shows one number lower than the preceding impression until it reaches 0, when it has to be reset by the meter clerk. The machine can be set to print any number of envelopes up to 100,000. The meter is kept locked and the key held by the meter clerk in the local post office, but no one would be able to change the total register even if he were able to unlock the device. The large illustration on this page shows the face of an envelope with the stamp printed in the upper right-hand corner, the first line showing the amount paid, the second the serial number, the third the name of the post office and the fourth the permit of the party owning the machine, these permits being registered so that the officials can check any irregularity.

It is claimed that this device prevents loss of postage stamps by theft or fire, and saves the Government the cost of manufacturing and handling. It is also claimed that mail matter can be put through the machine in one hour that it would require ten hours to stamp in the regular way with adhesive postage stamps.

A NEW IDEA IN STORE SEATS

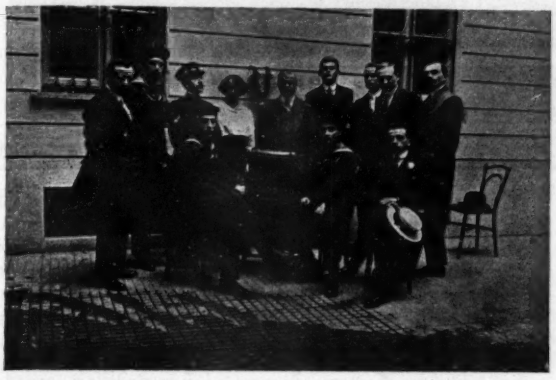
CONFECTIONERS, caterers, druggists and other concerns having soda fountains, and many other classes of tradesmen will be interested in the very novel arrangement of table and chairs shown in the small illustration at the foot of this page. These chairs are so designed as to fit snugly under the table when not in use, thus saving a great deal of space without in any way interfering with the comfort of the patrons. The table is 32 inches in diameter and both table and chairs are solidly built. If desired, the tables can be supplied with glass tops beneath which is a compartment for the display of confectionery, toilet sets or other small articles.

W. B. McLean Mfg. Co.

A compact arrangement of table and chairs for saving store space

TYPEWRITING CONTEST IN ITALY

THE accompanying illustration shows a detachment of four men from the Royal Italian Navy engaged in a typewriting contest held recently in Milan under the auspices of the King of Italy. Nothing can demonstrate more clearly the labor and time-saving capabilities of the modern typewriting machine than this example of the way in which it has conquered the conservatism that at one time prevailed in this particular field, the prejudice formerly

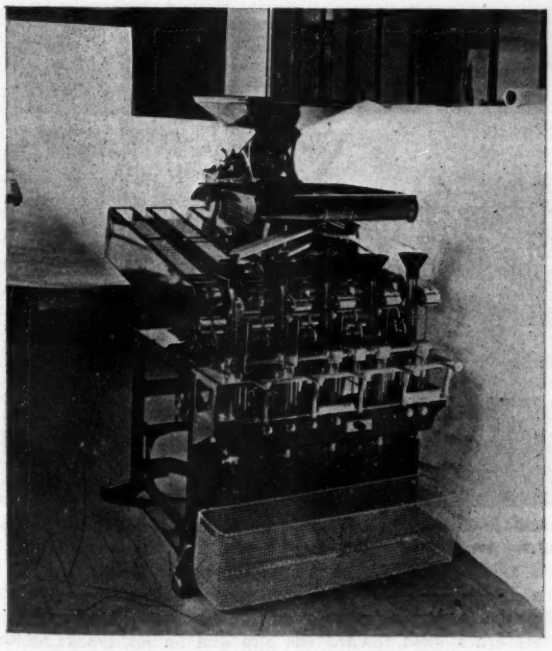


Men from the Royal Italian Navy engaged in typewriting contest at Milan, Italy.

existing in favor of handwriting having been entirely removed. The typewriter has so proved its advantages and convenience, that it is now used exclusively in the Italian Navy for writing letters or other communications, and it is understood that the introduction of the new model machines, with tabular attachments, is contemplated.

COUNTING COINS BY ELECTRICITY

THE accompanying illustration shows a device that has just been put on the market in which machinery almost surpasses human intelligence in the accuracy with



Westinghouse Mfg. Co.

An automatic device, operated by electricity, for sorting, counting and wrapping coins

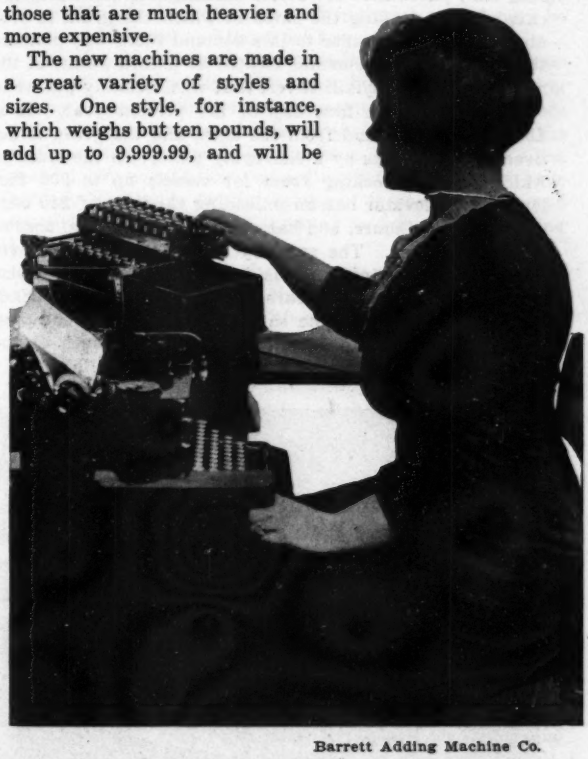
which it does its work. The operator can drop a lot of coins of miscellaneous denominations into the hopper, start the small electric motor, and the machine will sort the coins, count them, wrap them up in standard packages, or place them in sacks, as preferred, and separate the mutilated coins from the others and place them in a different receptacle. The machine is tireless, which the human brain is not, and unless it gets out of order it cannot make a mistake.

It will undoubtedly become popular among companies that have to handle small coins in large quantities, such as street railway companies, gas and electric companies, department stores, tax receiving offices, water companies, banks, moving picture theatres, etc. It cuts down the time required to handle money and reduces the cost considerably. It also eliminates errors in counting and prevents pilfering.

ADDING MACHINES FOR THE OFFICE

THE saving of time and the accuracy secured by the modern adding and calculating machine in office work are now so well appreciated that mercantile houses all over the world are adopting them. A line of adding and calculating machines has recently been placed on the market, the weight of which ranges from 10 to 17 pounds each. These little machines are said to be capable of doing quite as much and as accurate work as those that are much heavier and more expensive.

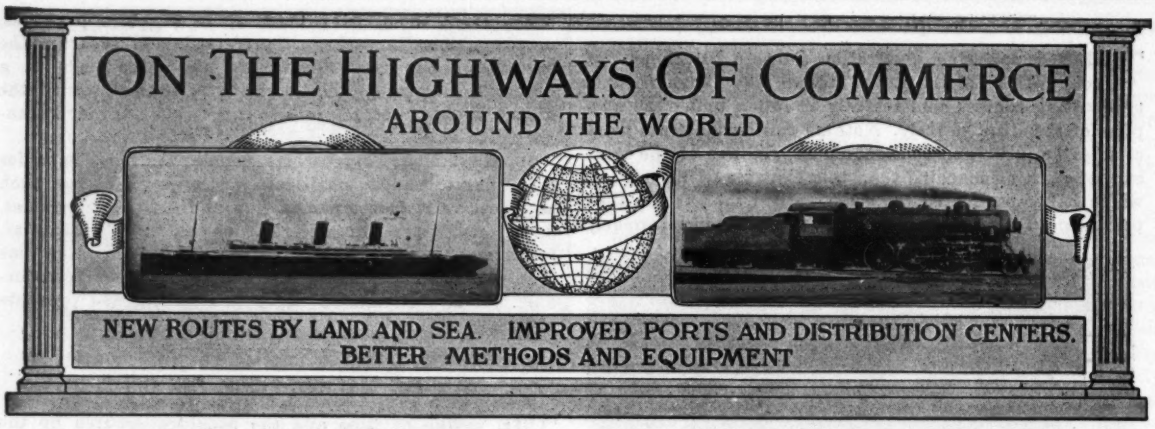
The new machines are made in a great variety of styles and sizes. One style, for instance, which weighs but ten pounds, will add up to 9,999.99, and will be



Barrett Adding Machine Co.

An adding machine weighing only 10 to 17 pounds that can perform many intricate operations

found of great convenience to the retail merchant doing a small business owing to its low price, as well as to larger concerns because of the ease with which it can be transferred from one desk to another. Another style, weighing only 17 pounds, will add up to 99,999,999.99. By means of small counters this total can be split into three different columns, making it practically three different machines giving totals of four, three and three figures, respectively. With the same machine, intricate sums in addition, multiplication, division and subtraction can be done quickly and without previous experience. Means are provided for correcting any mistakes that may be made, and wrong numbers may be thrown out of the machine even after the lever has been brought forward to its limit. Despite the light weight of these machines, they are very substantially built and not liable to get out of order.



A NOTABLE GRAIN ELEVATOR PLANT

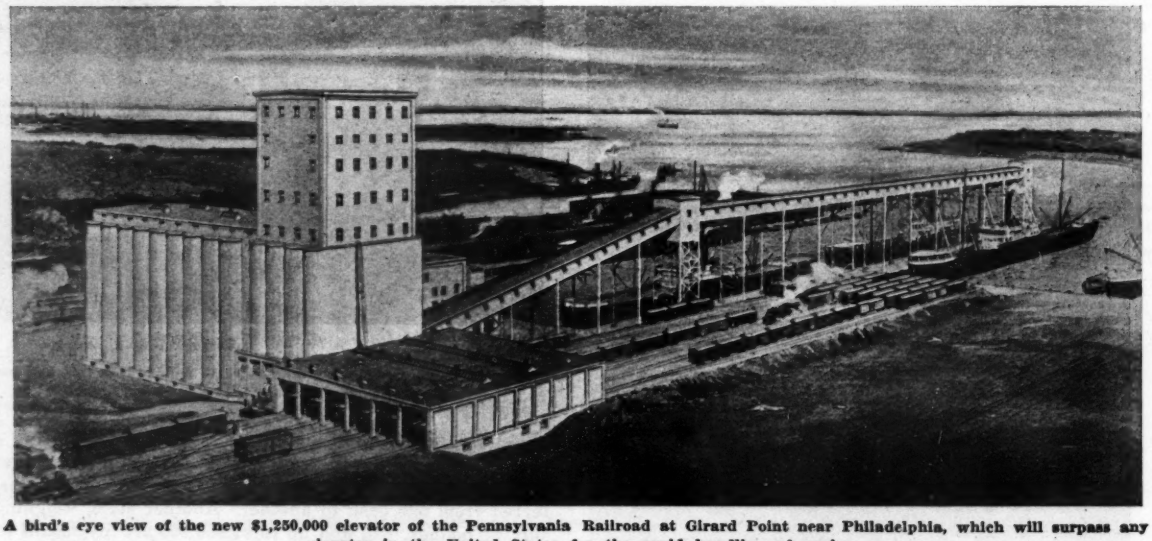
Big Ocean Steamers can be Loaded at the Rate of 60,000 Bushels an Hour

THE steadily increasing importance of Philadelphia as an exporting point for grain from this country for a long time past called for better facilities for unloading the cars and for loading the ships in which the grain is sent abroad, and in response to this demand there was planned the immense grain elevator located at Girard Point, at the mouth of the Schuylkill River, that was formally placed in commission on the first day of the present year. It is about 500 feet inland from the dock, and the grain is delivered to the ships by a conveying galley, on the sides of which there is docking room for vessels up to 900 feet long. The elevator has an unloading capacity of 240 cars per day of ten hours, and has sufficient trackage to accommodate 400 cars. The capacity and flexibility of the receiving and shipping plant is further increased by a six-track concrete shed, four cars long, permitting the unloading of twelve cars at the same time, while the shipping galley can load ocean steamers 650 feet in length at the rate of 60,000 bushels per hour.

The working house is 62 feet wide, 94 feet long and 202 feet high above the ground. It is divided into a basement, first story, bin storage and cupola. The basement provides room for the elevator boots, spouting, conveyors which run to the track shed, storage annex and drier, and the electrical motors and power machinery. The first story is 20 feet high. In it is located the discharge spouts from the working house, grain storage bins, and the loading end of the conveyors for transferring grain to the vessels.

Above the first story are the storage bins, twenty-four concrete tanks of 241,000 bushels total capacity, arranged in four rows of six each. They are 13 feet in diameter on the inside, 74½ feet high and have 7-inch reinforced concrete walls. Both circular and intermediate bins are used for storage. Above the bins is the cupola, a four-story structure, on the bin floor of which are five conveyors running out to the storage annex for transferring grain from the working house to the annex. Under the scales on the distributing floor are ten distributing spouts, each of 22-foot radius, for discharging grain from the scales to fixed spouts and conveyors.

Installed in one of the pits under the car track level is



A bird's eye view of the new $1,250,000 elevator of the Pennsylvania Railroad at Girard Point near Philadelphia, which will surpass any elevator in the United States for the rapid handling of grain

In general the elevator plant consists of a working house for the machinery, track shed, storage house or annex, and conveyor galley, pier, power-house and drier. Grain is received in the track shed receiving pits, and after unloading is carried to one of four receiving elevator legs and elevated to the garner over a receiving scale, from where, after weighing, it is spouted to bins in the working house for cleaning or shipment to vessels, or is carried on a conveyor belt to the annex for storage.

a six-drum car puller, so adjusted that loaded cars can be placed by a locomotive on the eleven stub tracks beyond the track shed toward the slip and on six tracks in the track shed over the pits. After the cars have been unloaded they can be kicked north down a slight grade by the car puller onto twelve empty car tracks.

The conveyor gallery, 1,000 feet long, extending on Pier 3 south from the working house, provides the facilities for loading grain into vessels. This gallery is built of struc-

tural steel with galvanized steel inclosing walls covered with felt and gravel; book-tile floor and roof are employed instead of concrete for the purpose of reducing the load. In each section of the gallery are four conveyors of 15,000 bushels capacity per hour, equipped with rubber belts. Dock spouts are provided on each side of the gallery, spaced on 60-foot centers, and are so arranged that grain may be shipped from any belt through any spout.

The new elevator is equipped with one of the largest grain driers in the country. It has a capacity of 3,000 bushels per hour. The plant also has the four largest grain cleaning machines in the country; 20,000 bushels can be cleaned in one hour.

To the east of the working house and connected to it by a concrete tunnel and bridge is the storage annex, consisting of fifty-four 13,000-bushel reinforced concrete circular tanks with a basement and cupola. The forty intermediate spaces have a capacity of about 3,300 bushels each. The storage annex has a capacity of more than 800,000 bushels.

MODERN TERMINAL WAREHOUSES IN NEW YORK

THERE is probably no single feature that reflects more clearly the remarkable business development of New York City than the construction of immense terminal warehouses at various points on the waterfront which permit the concentration under one roof of storage facilities, manufacturing plants, laboratories, offices and other departments of large industrial and commercial establishments, and at the same time provide the close connections with railroad and water transportation that are required by the diversified industries brought together at centers of this nature. Among the most recent of these buildings is the Terminal Stores, which are located directly on the

A recently built terminal warehouse at New York provided with adequate transportation facilities

North River, between 27th and 28th Streets, in close proximity to most of the leading transatlantic steamship lines. The Baltimore & Ohio, Lehigh Valley, Erie, Delaware, Lackawanna & Western and the New York Central railroads run direct tracks into the buildings or adjacent to them, while the Panama line, running through the Panama Canal to the Pacific Coast and the Far East, occupies a pier immediately adjoining, so that the transportation and delivery problems always encountered when a number of industries are brought together are satisfactorily solved. The buildings are thoroughly equipped with modern electric elevators, loading platforms and inside track connections with the railroads, and have every possible facility necessary for the rapid and economical handling of freight.

One of the largest manufacturing and wholesale grocery houses in the country, whose different plants have heretofore been widely scattered, is among the various prominent concerns that have recently taken advantage of the conveniences offered by the Terminal Stores. Their new quarters will enable them to operate their own storage plant, manufacturing plant, warehouses, salesrooms and offices all under one roof, and by materially reducing the cost of production and distribution exert a marked effect on the prices of food products in New York City and vicinity. It is reported that other large firms contemplate following the example of the one above referred to and numerous changes are probable in the near future.

A NEW RAILROAD IN THE REPUBLIC OF PANAMA

The Line to David now Definitely Begun will Open Up a Most Fertile Region

THE building of a railroad in the David section of Panama, so long discussed by the local authorities, has finally begun, the first spike having been driven by President Porras on April 7. Messrs. R. W. Hebard & Company, who built the city tramway line at Panama, are the contractors for the work, which will be carried out under the supervision of the Government. It is estimated that the entire project will cost the republic $1,600,000. This, however, may be reduced "by the Government supplying steel rails and certain amounts of ties that may be available from the Isthmian Canal Commission."

The work embraces two sections—the Pedregeal-David-Boquete line, 33 miles in length, and the David-La Concepcion line, a length of 20 miles. Of these two portions, less labor will be required on the Concepcion division, while on the Boquete line, where the road must attain an altitude of 4,000 feet, the work will be of a much heavier nature. For 15 miles, in order to reach this elevation, grades of 5 and 6 per cent. are called for in the survey. The gauge as specified is three feet, and all material needed may be purchased abroad and imported free of duty.

For the financing of the work it is proposed to issue bonds of the Republic of Panama, the contractors having agreed to accept these bonds as payment and "to advance such amounts as may be required for inaugurating the work until the proceeds of the issue are available." The preliminary negotiations, according to the local press, have already been made for the issuing of these certificates and no serious difficulties are expected to delay the beginning of the work.

Although only within the last year has the project been authoritatively considered, the history of an interior railroad for the Republic of Panama, such as is about to be realized, dates back to 1893. In that year the international survey, conducted by Col. Wm. Shunk, was carried out in a preliminary manner from San José, Costa Rica, to Quito, in Ecuador, the Panama section of the survey embracing a route from David to Panama City. Twelve years later "a contract was entered into with the Panama Railroad Company for a complete survey of the Panama-David line, with a branch to the Province of Los Santos." The estimated cost of this undertaking, as arrived at by the engineers, was some $10,000,000, and during the administration of President Arosemena the necessary tenders were solicited. These, however, were rejected later and nothing was done until 1913, when the National Assembly took up the subject of giving the country an interior railroad and passed the authorization under which the present work is to be carried into effect.

By the construction of this line, or rather of the two divisions of it, one of the most fertile and promising districts of the country will be opened up and doubtless developed to a very appreciable degree. As an index to the resources of this northwestern province, including the districts of Bugaba and Boquete, it may be mentioned that last year no less than 600,000 pounds of coffee were produced in this latter division of the country, and this, too, despite the lack of railroad facilities or even of poor highways. With a soil and climate suited not alone to the raising of the coffee berry, but all kinds of fruits and vegetables common to the temperate zone, a great impetus is likely to be given to agricultural pursuits in this region, hitherto exploited in the most limited manner and with none of the advantages necessary to serious and profitable farming. Although the line will not extend into Panama City, it will have a suitable shipping point at Pedregeal, through which the output of the province will reach the sea and be thence transported to Panama by coasting steamers specially engaged in the trade. The new railroad is expected to stimulate many local industries.

ENLARGING THE SUEZ CANAL

IMPROVEMENTS now progressing on the Suez Canal, for which the company has power to raise $30,000,000 through bonds, are expected to be completed in 1918-19. Until the present scheme of improvement was put in hand, progress in providing for ships of more than 24 feet draught has been slow. The maximum permissible draught of ships using the canal was 24.4 feet in 1870; in 1890, 25.4 feet; and during the following 24 years the increase has averaged about one foot every six years. It is now 29 feet.

The declared policy of the canal company is to offer a slightly greater depth than that available in ports east of Suez. It is claimed that other than Sydney there is no eastern port which at low tide has a greater depth of water than that now provided in the canal throughout the full length of nearly 105 miles. In any case the work in hand should meet the needs of any ship likely to be built for the eastern trade during the next few years.

The latest scheme makes provision for a depth of 40 feet throughout and for widening up to 196 feet 8 inches in the south section and cutting an appropriate number of sidings in the north and central sections, where a minimum width of 147 feet 6 inches is believed to be sufficient for the requirements of the immediate future.

Enlarging the capacity of the canal presents no special engineering difficulty. Considerable sand is occasionally driven into the channel at Port Said during storms, a remedy for which will be the extension of the west breakwater by about 2,700 yards, at a cost of over $3,000,000. Its construction is making satisfactory progress. The Suez Roads are being adequately dredged in accordance with an agreement between the Egyptian Government and the company.

To carry out the improvements which have been decided upon the canal company has acquired a powerful dredging plant, which comprises 24 dredgers of various types, representing over 16,000 horsepower and having an extracting capacity of about 8,000 cubic metres an hour. Four of the most powerful dredgers are employed cleaning and deepening the channel at Port Said.—*Shipping Illustrated.*

AMERICAN EXPORTS RESUMING

SHIPMENTS of case oil and of heavy steel products, from New York to foreign ports, slackened appreciably for a time after the outbreak of the European war, but they have been resumed and now are proceeding much as usual, even to the ports of Asia and the Far East. Cargoes for these places move via the Suez Canal.

Under ordinary conditions several large steamers leave New York each month, for India and beyond, loaded wholly or in part with refined petroleum in five-gallon tin cans, packed two to the case. Shipments of 10,000 cases are not at all unusual. India is a huge consumer of illuminating oil; so is China. If anything happened to delay their supplies materially it would cause discomfort to a great many millions of persons.

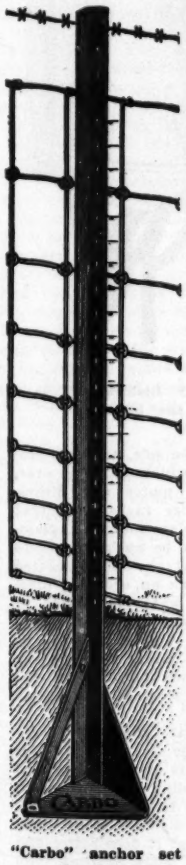
Steel beams, rails, etc., have been going in considerable volume to Northern Africa. Oran, in Algeria, is the first port of call for the steamers for beyond Suez. India, Japan and the Philippines are also large consumers of these American steel products.

Information For Buyers

As it is frequently impossible for advertisers to explain clearly the purpose or peculiar merits of their products in the advertising columns, space in this section is placed at their disposal to enable them to do so. It is proper to add that they, and not the publishers, are authority for the statements made.

The Advantages of Steel Fence Posts

MUCH has been said in recent years regarding the application of business principles to the farm, and a great deal has already been accomplished in the way of increasing the crops by proper fertilization and the employment of labor-saving machinery. More attention has also been given to keeping the various buildings in perfect condition and the importance of proper fencing is realized to a greater extent than ever before. No longer does the old style stone or rail fence, with its waste of ground and its harboring place for weeds exist on the property of the progressive, successful farmer, for he has found that it is far more expensive in many ways than would be one substantially and durably constructed of barbed or woven wire.



"Carbo" anchor set line post

The cost, however, of fencing a farm today, even though it be of moderate dimensions, is sufficient to cause the average owner to investigate the matter of expense much more closely than he did when it was largely a matter of cutting down a few trees to mark the boundary lines. Now he wants a fence that will take up the minimum amount of room, be strong and durable and as low in price as possible. So far as regards the fence itself the problem has been very satisfactorily solved by the various forms of wire fencing, but in the matter of posts, which is quite as important, it has taken a much longer time to settle on what is best for the purpose. Wood posts are heavy and cumbersome, quickly decay and are harboring places for all kinds of vermin, while the objections to concrete posts are that they are subject to fracture by exposure to extremes of heat or cold, are heavy and unelastic, difficult to set in place and liable to be lifted from the ground by the action of the frost.

There is now available, however, a post which is claimed to meet every requirement in the way of economy, durability and strength. This is the "Carbo" Flexible Steel Post, manufactured by the Carbo Steel Post Company. The patented anchorage system is simple and sure and has nothing complicated about it. It simply embodies well-known scientific principles and makes use of them in the most practical way. No attempt has been made to make the post rigid at the ground line, as any post that is rigid at that point will invariably crack, bend or snap off if any undue pressure is brought to bear. The Carbo Post is anchored securely at the base, and as it goes up toward the ground line it becomes less rigid. Play is allowed the post, and the cushion of earth around the ground line acts as a shock absorber, while the elasticity of the post itself takes up the balance of any strain that may be brought to bear on it so that the action is exactly the same as in a steel spring. A Carbo post can thus be pulled out of alignment as much as 30 inches without in any way affecting its security. It will spring back as soon as released and will be in no way injured. The company have issued a very interesting booklet giving all particulars regarding their fence posts, and a copy will be sent to any address upon application to The Carbo Steel Post Company, 877 Rand McNally Building, Chicago, Ill., U. S. A.

Lamps for the Home, Factory and Out-of-Doors

KAUFMAN Powerlight lamps burn from 95 to 97 per cent. air and only 5 or 3 per cent. fuel oil. They are cheaper than gas or electricity. The Powerlight table lamp, for example, is 300-candlepower strong and burns 20 hours on one quart of fuel. At ten cents a gallon, this is at the rate of a little more than a cent for ten hours. The quality of the light is wonderfully mellow and closely approximates the light of day. It is restful to the eyes. Physicians and oculists recommend it.

The Powerlight table lamp—which is also made in a wall combination—is self-contained It has no unsightly wires, tubing or other trailing connections that may break and bring disaster. The supply of gas or electricity may fail in stress of weather, but gasoline and kerosene are the cheapest and most widely distributed fuels in the world and can be obtained anywhere. The makers claim that these lamps cannot explode or spill the fuel, and that it is absolutely safe to hold one of them upside down or even to roll it on the floor while lit.

Simplicity of construction is another feature. Kaufman lamps are made of heavy metal throughout, and by craftsmen who take pride in their work. They are handsomely designed and strongly finished. They are claimed to be the only lamps that will burn either gasoline or kerosene without changing or adjusting any of the parts.

Other striking features about these lamps are that they do not smoke; they are noiseless and odorless; there are no wicks to trim and no chimneys to clean. They come in many designs, elegantly finished in nickel plate, Colonial brass, Pompeiian green or oxidized copper, with art domes in removable green or amber glass panels. The trimmings match the finish of the lamp.

The Kaufman lights that run from 500 to 1,000 candlepower are claimed to be a perfect substitute for electricity, and to give ten times more light at one-tenth the cost. Also they are tamper-proof, storm-proof, weather-proof, safe and sure. They are invaluable in every place where a large amount of light must be widely diffused, as in depots,

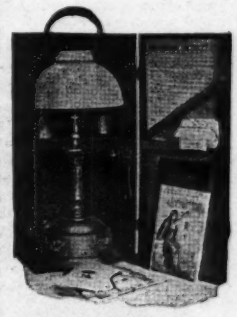
Portable arc light

Table lamp

on docks, the decks of ships, in factories, theaters, mines, churches, restaurants, etc., and everywhere out of doors. They have been passed by the National Board of Fire Underwriters, and are accepted by insurance companies without any increase in rate.

The portable arc light—500-candlepower—burns 28 hours on one gallon of kerosene. It is especially adapted for outdoor use, and can be mounted on a sled for use in the field. One of the 1,000-candlepower system lamps will brightly illuminate a room 75x150 feet. Any number of lamps can be operated from one tank.

A complete Kaufman lighting system consists of lamps, tubing, tank and pump. Any number of lamps can be fed from one tank. The portable arc and table lamps, however, are self-contained.



Salesman's case

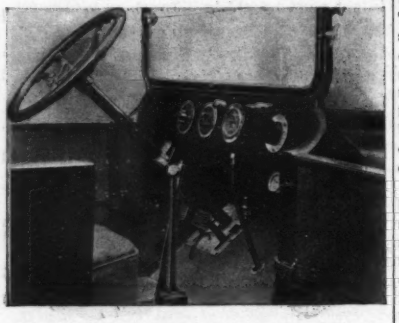
Ordinary kerosene oil and air are pumped into a tank. The air pressure forces the oil through a small flexible tube the size of a straw into the vaporizer, where the oil is heated and mixed with air. The gas formed is burned under a strong mantle and gives a light of intense purity and brilliancy. It is claimed that this is the only vapor lamp on the market in which the light can be regulated or turned out like gas.

All Kaufman tanks are made of drawn steel in one piece and will withstand ten times the pressure required. They are provided with an automatic check and safety valve, which in case of a fire in a building automatically releases the pressure and all the oil in the tubings is drawn back into the tank. Should the tank be in the fire, the oil will burn out in a vertical flame. An explosion is absolutely impossible.

The A. G. Kaufman Mfg. Company desire agents in every part of the world, and will allot exclusive territory to their representatives. For the use of their agents there is a demonstrating outfit which is especially attractive and convenient. For catalogues, export prices and full particulars regarding agencies, write to the A. G. Kaufman Manufacturing Company, 83 Reade Street, New York City, U. S. A.

A Moderate-Priced Car of Substantial Construction

ONE of the most attractive automobiles that has been placed on the market for the season of 1915 is the latest production of the King Motor Car Company, a 30-35 horsepower 5-seated touring car, which the makers state is as "sturdy as a steam shovel and as graceful as a swan." This car, which is made to sell at a moderate price, is claimed to be a marked advance over anything of similar



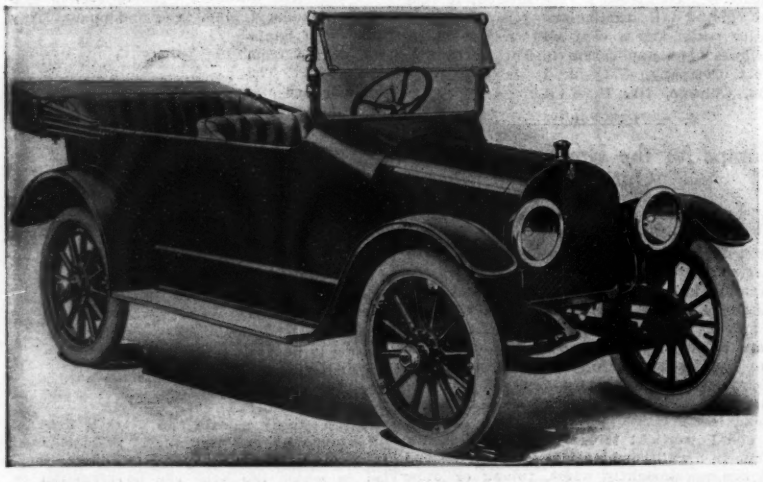
Some of the equipment that adds to the convenience and safety of the car

design heretofore offered by this company The real intrinsic value embodied therein is made possible by an experience gained during a period of more than twenty years of motor car manufacturing and the possession of a factory with a capacity of over 7,000 cars per annum. A large number of automobiles made by the King Motor Car Company have been sold abroad, and are now giving satisfactory service in all parts of the world. When preferred, a roadster body can be substituted for the touring body, but both the chassis and the price are the same.

The front axles are of the drop-forged I-beam section type, while those in the rear are of the full floating type in pressed steel housing on high grade ball bearings. The clutch is of the multiple disc, cork insert type, with 17 discs. Control is by means of a center change ball and socket gear lever, with a spring, which holds it perpendicular at neutral, placed inside the car at the right of the driver. There is a thermo-syphon system of cooling and a honeycomb radiator with a 6-bladed fan. The drive is by direct shaft, the propeller shaft being enclosed in a torque tube supported at the front end by a yoke. The Ward-Leonard electric system is used for starting and lighting; this starter turns the engine at the rate of 140 revolutions per minute; the patent controller always keeps the battery charged, prevents too rapid charging and allows full ampere charging rate to battery at 10 miles per hour or over; it is operated by a push lever located at the right of the driver.

The carburetor is a special improved Stromberg model and ignition is provided by a dual system consisting of a Bosch high tension magneto and 80-ampere hour battery. The instrument board contains gasoline gauge, electric light switch, ignition switch, gasoline filler cap and speedometer, the latter being lighted by electricity. The lamps comprise a full electric equipment operated by an 80-ampere hour Willard storage battery; the head lamps are 11 inches in diameter and have small bulbs inserted for dimming when running in cities. An electric tail lamp is also provided. The transmission is of the sliding gear selective type, with three speeds forward and one reverse. The car is upholstered flush with the body in conformity with the stream-line design; the back is piped straight and the cushions are diamond tufted, the latter being extra deep and tilted to ensure easy riding.

Equipment consists of electric horn, with button in the center of the steering wheel, rain vision ventilating windshield, silk mohair one-man top, quick detachable curtains, Stewart-Warner speedometer, tire irons, pump, jack, tire repair outfit, tools and extra rim. The company has prepared a handsome catalogue giving full specifications and illustrations of their new car, and they will be pleased to send a copy to any interested person in any part of the world upon request. Address King Motor Car Co., Export Department, 50 Union Square, New York, U. S. A.



The King 30-35, five-seated, moderate-priced touring car is the result of twenty years experience in automobile building

The power plant with which Model "C," as the new car is designated, is equipped is a standard 4-cylinder L head motor moderately rated at 30-35 horsepower, with a bore of 3 15-16x5 inches, and it is so powerful that no trouble will be met with when negotiating hills or poor roads. It is flexible, quiet and has no vibration. The motor, clutch and transmission are in one housing suspended on the frame at three points, while the cylinders are bolted to an aluminum alloy crank case that serves as an oil reservoir for a combined force feed and splash system of lubrication. The valves, which are located on the left side, are fully enclosed and have a diameter of 1 13-16 inches. They are easily removable and interchangeable and are provided with roller push rods.

An Improved Dishwashing Device

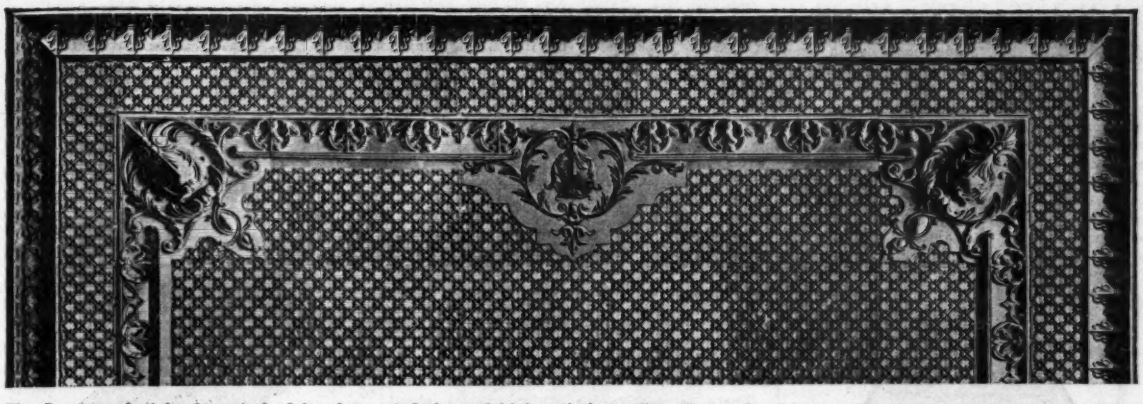
ONE of the most disagreeable tasks that confronts the housekeeper to-day is the washing of dishes after every meal, and it seems strange that, with the many devices that have been introduced for saving labor in almost every direction in most homes, there have been no improvements in the methods of doing this work. Although dish-washing machinery has been used in hotels and institutions for a long time past it is only a comparatively few years ago that attention was drawn to the immense demand that awaited the introduction of some device of this nature.

The announcement, therefore, of the Hershey-Sexton Company, of 1219-1221 Filbert Street, Philadelphia, Pa., U. S. A., that they have succeeded in producing a dish-washing machine designed especially for family use will be interesting news to many women who are tired of doing this work in the old-fashioned way. The new machine, which is called by the manufacturers the "Whirlpool Sanitary Dishwasher," is claimed to be simplicity itself and to be capable of doing even better work than can be done by hand. The new washer consists of a substantial sheet metal tank of sufficient capacity to wash all the dishes of an ordinary family at one time. At the bottom of this tank is a propeller

The "Whirlpool Sanitary Dishwasher" is a labor-saver in the kitchen

operated by a lever on the side, and this propeller gives the water a whirling motion over, around and inside the plates and dishes, which are placed on wire racks. All that is necessary to do is to place the china, glassware or silver that are to be washed on these wire racks and then put on the perforated cover. After this is done an ordinary dishpan full of hot soapy water is poured in and the lever at the side pushed forward and back a few times. The dirty water is then allowed to run out into a pail through a tube on the side opposite the lever and the operation completed by rinsing with a pan of clean hot water.

The manufacturers state that the Whirlpool Sanitary Dishwasher is acquiring great popularity wherever it is made known and that many agents are finding it a most profitable article to handle as it instantly appeals to every woman who has dishes to wash. This is because of the fact that it does better and more work in a shorter space of time than is possible by hand, that the dishes, plates and glass are not liable to be chipped and there is no necessity of spoiling the hands by putting them in hot, soapy water. Another feature of very great importance is the fact that the possibility of using boiling water ensures the thorough sterilization of every article placed in the washer and thus assists very materially in preserving the health of the family using it. Illustrated catalogues, prices and other particulars can be obtained by inquiring of the company at the above address.



The Garry product is characterized by clear-cut designs of high artistic quality, the result of long and careful study by expert modelers

Metal Ceilings and Side Walls

THE marked success of the sale of metal ceilings and side walls in all foreign countries has prompted The Garry Iron & Steel Company to enter extensively into the export field. After the most careful study and with the assistance of a large corps of expert designers and modelers, the company have produced a complete line of steel ceilings and walls in a large variety of designs, which they report are most excellent and particularly adapted to meet the demands of the export trade.

These ceilings are claimed by the manufacturers to embrace all the important advantages found in other metal ceilings and to possess many original and distinctive features of their own, such as the high artistic quality of the designs and the utmost simplicity of construction.

The export department of the Garry Iron & Steel Company is under the direction of Mr. Charles J. Dodge, and his experience covering a period of over 20 years in handling all details of export trade gives assurance that all inquiries and orders will have most careful and intelligent attention.

The company desires to secure capable and satisfactory agents in the principal buying centers of the world where they are not now represented. They desire especially to open negotiations with agents and importers who have been handling metal ceilings, but who now are unable to procure prompt deliveries from European manufacturers. The Garry Company has such unusual facilities that every order received is shipped without the least delay. The export department will be glad to furnish inquirers with full particulars regarding agencies and the districts in which it is open for representation.

It is the custom of this firm to give an exclusive territory to each of the agents that it appoints. It has had long experience in the foreign trade, and appreciates especially the necessity of co-operating to the utmost with its representatives by giving them uniformly quick shipments and the best of service. Foreign agents know how important is aid of this sort from the manufacturers they represent.

The advantages of metal ceilings are so obvious that wherever they are introduced they are supplanting ceilings of plaster or of cloth. Being far more durable, they are the cheapest in the long run. No plaster ceiling, unless fashioned at great expense, can equal the metal product of the Garry Company in beauty of design.

The ceilings manufactured by the Garry Iron & Steel Company nest perfectly together and occupy very little space. They weigh about 55 pounds to every 100 square feet of surface (25 kilos per 9.3 square meters) net, or 65 to 70 pounds gross when boxed. Agents in a position to erect the ceilings with the aid of their own workmen can secure the double profit derived from the sale of the material as well as the labor, and can make this an important branch of their business.

One of the accompanying illustrations shows the Garry metal ceilings and side walls used in an office, illustrating forcibly their adaptability for interior construction of office buildings, cafés, restaurants, stores, schools, churches, hospitals, and in fact all classes of buildings from a cottage to a cathedral.

A complete stock of all designs is carried in New York City and all shipments are made from that point. Prices will be quoted either f. o. b. New York or c. i. f. the seaport nearest to the interested party. The goods for export shipment are carefully boxed—not crated—for the firm appreciate the importance of good, strong boxing to insure the arrival of the merchandise at destination in perfect condition.

Aside from metal ceilings and side walls, the Garry Iron & Steel Company have been prominently known for many years as manufacturers of high-grade sheet iron and steel products, as, for instance, galvanized and black sheets, expanded metal lath, corrugated and formed roofing, metal shingles, corrugated arches, rock face and brick siding.

Particular attention is directed to the new roofing shingle manufactured by the firm, known as the "Five-on-One" shingle, which is said to be a perfect water shedder and may be applied with the minimum amount of labor. It will form a most attractive roofing that enhances the architectural beauty of any building. Made in galvanized steel, the shingles are fireproof, rustproof and of light weight when compared with either slate or tile. These shingles weigh about 80 pounds to 100 square feet net, and packed in cases containing 200 square feet each, they weigh about 200 pounds gross per case.

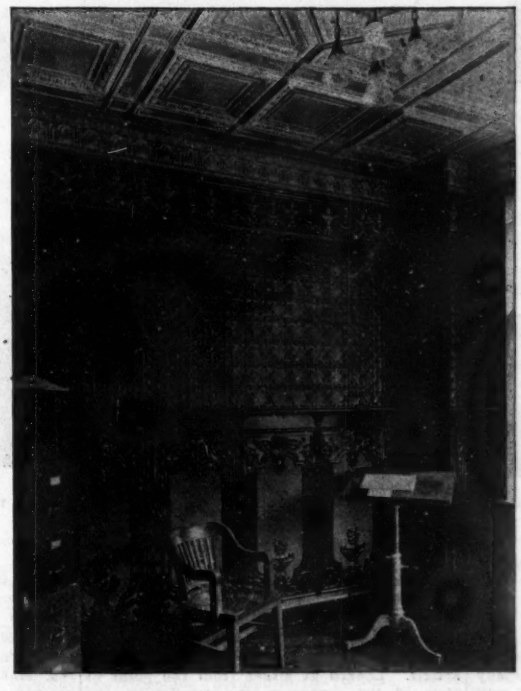
The company states that it has, in the past year, made some very satisfactory connections in some of the principal buying centers throughout the world, but it still has territory open, and is desirous of securing responsible, capable agents who will secure a large volume of sales commensurate with the advantages offered in the Garry products. To such agents this firm will grant exclusive sale of their product in their respective territory, and will offer maximum co-operation, quick shipments and the best of service.

It makes an especial appeal to the agents and importers who have been handling foreign products heretofore and who, no doubt, will be unable to secure prompt delivery from their European manufacturers, to consider taking on this extensive and profitable line. It is in position to make prompt shipments of any orders it receives by cable or otherwise.

Beauty, convenience and durability are their distinguishing characteristics. The designs are clear cut and of high artistic quality—the result of long and careful study on the part of a large corps of the most expert designers and modelers. Simplicity of construction, which is quite as important, also has been achieved. When the Garry products are shown to prospective buyers, little further argument is needed to close a sale. The company's agents have always found this line very profitable and satisfactory to handle. Wherever these ceilings have been put in a building they have proved to be a perpetual advertisement bringing a steady volume of fresh orders.

For full particulars, correspondence should be addressed to the Export Department, Garry Iron & Steel Company, 525 West 23rd St., New York City, U. S. A.

A corner of an office showing application of Garry metal ceilings and side walls



A High Grade Floor Varnish

KYANIZE is the trade name of a floor finish manufactured by the Boston Varnish Company, whose advertisement appears on the inside back cover of this magazine. This concern are also makers of high-grade varnishes for the architectural, automobile and railway trades.

Paint and varnish are quite as essential to houses and their furniture as clothing is to human beings. "The apparel oft proclaims the man." Paint and varnish are the apparel of the house which proclaims the kind of people who live in it. Houses have distinct personalties just the same as people. It is the paint, as much as anything, that gives them distinction.

Lithographed oval hanger supplied to Boston Varnish Co. dealers

The clothing of inanimate objects must be durable as well as beautiful. In the house the floor has to stand a ninety pound blow at every step when an adult human being walks across it. Children, though lighter in weight are heavier in action. The healthy, happy boy can walk ten times heavier than his sedate father. But if the floor isn't made to walk on, it should be.

Lithographed steel counter display cabinet for Kyanize floor finish

The only way to make a successful floor finish is to make one that will stand this terrific wear. The Boston Varnish Company state that their floor finish, "Kyanize," will do this at all times and under all conditions.

Kyanize, its makers state, is composed of materials which retain their resiliency and brilliancy. The blows of the ninety-pound heel rebound from it. They may dent the wood, but cannot break the Kyanize finish.

Water, the company adds, is the friend—not the enemy—of the Kyanized floor. It can be scrubbed like an enameled sink or bathtub. The floor with this covering becomes hygienic, wearable and beautiful. A damp cloth restores it instantly to its former lustre.

Kyanize is made in clear or natural and seven beautiful colors: light oak, dark oak, cherry, walnut, mahogany, rosewood and colonial green. A ground color may be used for a first coat on floors that have been painted or are badly worn, or when it is desired to make a dark floor lighter, but on new work only Kyanize of the desired color need be used.

There is a Kyanize white enamel also, which gives a beautiful white surface—dull or glossy, as preferred—and may be cleaned like a china plate. It wears indefinitely and does not turn yellow with age. It retains its smoothness and creamy quality in all climates. It will not show brush marks or streakiness when applied to a properly prepared surface. It is equally suitable for applying to wood, metal or plaster. Its manufacturers further claim that it will not check, crack or seam.

One gallon of Kyanize will cover 400 square feet of floor. Two coats, when properly applied, and in good, clear weather, will be dry enough to walk on in eighteen hours.

While Kyanize was especially made for floors, it has become a universal finish for all woodwork, its manufacturers claim: "Whatever work you have to do there is a Kyanize Finish for it," says one of the circulars. The Kyanize floor finish is for all floors and interior work; the Kyanize white enamel is for white work on parlors, bedrooms, iron beds, etc., and the Kyanize spar finish is designed for motorboats, yachts, outside doors and all exposed work. There is also a Kyanize flat and gloss black for iron work.

This Kyanize spar finish is guaranteed not to turn white, crack or soften in salt or fresh water, in heat or cold, sun or wind, or in any climate. It is said that more than 20,000 gallons of it have been used on the warships of the United States Navy. It has been tested, approved and used in five of the United States Navy Yards. It is just as good for outside doors, window trims and porches, and keeps them looking like new, for it is sunproof.

The Boston Varnish Company state that there is hardly a town or city in the United States and Canada where there is not an enterprising dealer advertising and carrying their Kyanize paints and varnishes in stock.

The policy of the company is to sell only one dealer in each locality. But their interest in these distributors does not cease when they have filled their orders. They help every individual dealer by their up-to-date advertising plans. They furnish him with electrotypes for use in advertising. They supply him with handsomely illustrated circulars and booklets describing verbally and pictorially their various products. They do all this free of charge. On this page are reproduced a few of the different pieces of advertising matter that are furnished to the company's agents. It is the principle of the company to stand back of their product and to aid their agents in every possible way.

The advertising system of the Boston Varnish Company, by which it helps the dealer just as efficiently, no matter if he is in Boston or Benares, is invaluable to an agent, not only when he is introducing Kyanize into a new market, but also in extending his established trade and in reaching the ultimate goal—100 per cent. of the business in this line.

Some idea of what this advertising is may be gathered from the illustrations in this article. Looked at either from the point of view of the consumer, the retailer or the professional painter and decorator (who is not only a consumer on a large scale but also has to be an expert judge of paints and varnishes), this advertising is attractive and convincing. It makes people want to buy.

Kyanize paints and varnishes are sold only in sealed cans. The contents of every can are guaranteed in the following straightforward and unequivocal terms:

"This can contains varnish made from strictly pure materials according to the most scientific principles. It is thoroughly filtered and properly aged, and guaranteed to give absolute satisfaction if used for the purpose intended."

"We hereby guarantee Kyanize to be and do all we claim, and agree to refund the purchase price for the empty can if Kyanize does not prove satisfactory when properly applied to a proper surface."

Lithographed cut-out, in ten colors, for Kyanize dealers

The Boston Varnish Company want distributing agents all over the world. In soliciting an export trade they say they will use the same methods that have built up their excellent business in America; they will furnish only the highest grade goods at reasonable prices, and will sell to only one reliable distributor in each locality.

Another handsome lithographed cut-out, made life size

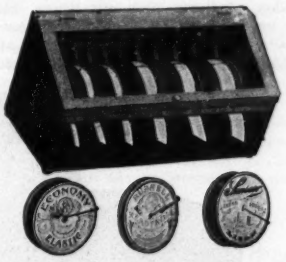
Those interested in an up-to-date line of high-grade varnish should write to the Boston Varnish Company, Everett Station, Boston, Mass., U. S. A. Inquiries will receive prompt attention and will be answered in whatever language they are received.

Elastic Webbing and Cotton Belting

THOROUGHNESS is an essential to the success of every business, especially when long continued. The Russell Manufacturing Company, of Middletown, Connecticut, was started about 1830 by Samuel Russell, who was at that time the head of Russell & Co., large merchants in the trade between the United States, China and the East Indies, and was incorporated four years later. In the beginning there was only one small mill run by water-power. Now there are thirty mills run by electric power. The company has been under the management of the same family since its beginning. It was the first manufactory to weave elastic web on a power loom, and the first in the United States to make cotton machine belting. The high standards established by its founders have been steadily maintained and advanced throughout the more than four score years of its existence.

Solid woven cotton machine belting

This business is an exemplification of thoroughness continued through several generations. The Russell Manufacturing Company makes everything from the heaviest cotton belting to the most delicate webs and braids. Only the very best of materials are used. Rubber and cotton have to be of the highest quality suitable for the purposes for which they are employed. This firm states that it has the best dye house in the United States for the line of goods that it manufactures. It makes many of the yarns that it uses and does its own dyeing. The company also adds that in the various processes of manufacture the most modern machinery is used and that its workmen are highly skilled—the majority of them having been with the Russells, father and son, since boyhood, and their fathers before them. The proper manufacture of webbing is a matter of experience and machinery. The makers claim that one reason for the excellence of the Russell product is the incessant care exercised in its manufacture. There is no carelessness.



Glass front display cabinet for counter sales, with webbing in rolls

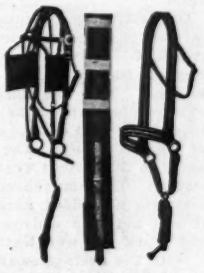
Two grades of cotton belting are produced, but many combinations of widths and thicknesses, up to belting that is 44 inches wide and ten-ply thick. These cotton belts, according to their size, are used for the transmission of power or for conveying purposes. Certain grades are waterproof, and are guaranteed not to stiffen, no matter how severe the service may be. They are climate proof. In the Michigan sawmills, for instance, the winter and summer maximums of temperature are the extremes of arctic cold and tropic heat—from 40 degrees below zero to 100 above. But the Russell cotton belts are used all through this lumber region and have been giving perfect satisfaction, winter and summer, for years. One advantage of this particular cotton belt is that it is one solid piece, whether it is one ply or ten, not folded stitched canvas. That insures its strength and durability.

Garter web in two forms of packing—flat and in rolls

But belting is only one section of the Russell Manufacturing Company's products. It makes elastic webs of every conceivable kind: suspenders (or braces) in hundreds of different beautiful patterns, garter webs, corset webs, braids, asbestos and wire automobile brake linings—these have to be woven on very heavy and powerful looms; clutch discs of asbestos and brass wire; harness made exactly like regular leather harness, but of cotton web—the best of these harnesses are waterproofed; surcingles (or rollers), halters, trunk, box and bag straps, and any other kind of cotton strap that can be thought of.

In the manufacture of elastic webbing especially the factory supervision has to be unrelaxing and exact. The moment a thread breaks the machine is stopped. There is no repairing of a flaw—no attempt to do so. It is cut out of the piece. Every first quality piece is as nearly flawless as human skill and constant watchfulness can make it.

The Russell Company manufactures and sells approximately 350,000 dozen suspenders a year, besides making elastic webbing for other manufacturers sufficient for 1,000,000 dozen more. Its output includes suspenders of several well-known brands. Ends are furnished woven or in leather. The kinds of buckles and trimmings are almost innumerable. They meet every taste and fashion around the world. Colors and patterns may be had in inconceivable variety. The better grades of suspenders are furnished packed in artistic individual boxes if desired.



Cotton web bridle, surcingle and halter

The Russell Company prides itself on its methods of packing and displaying its goods. Elastic webs are wound on reels and put in glass-front cases for retail display and sale. The retailer will recall that many of the reels used for this purpose have to be taken out of the case when the web is rewound.

Suspenders for Christmas box trade—made in more than 100 styles

The Russell reels can be wound inside the cabinet without removing them. The cabinet can be refilled at a moment's notice. This is a distinct advantage. The webs shown in one of these Russell cabinets run from

General view of the thirty modern mills of the Russell Manufacturing Company at Middletown, Conn., U. S. A.

¼ to 1 inch in width, the graduation being by eighths of an inch. There is one black and one white reel of webbing of each size.

In harness the Russell Manufacturing Company makes every kind that can be made in web, from the heavy truck harness to that for a Shetland pony. The truck harness stands a test on each of the traces of more than 5,000 pounds. Some grades of harness are waterproofed and look much like leather. This web harness is particularly easy to keep clean—not even soap is needed—only clear water.

One attractive feature about this cotton harness is disclosed when the price list is examined. It costs only about one-third as much as leather harness and lasts two-thirds as long. The web harness that has been waterproofed is about half the cost of leather harness of equal quality and will last as long as the leather will. The parts that are subjected to the hardest wear are reinforced with leather. In damp climates the cotton harness has a decided advantage over leather. It will not hold moisture, and will not dry and crack the way leather does.

With the average small farmer the cost of a harness, single or double, is a very important affair, if it is to be of leather. Few feel that they can afford a new set of harness when they need it, and keep on patching the old until it becomes dangerously unsafe. The cotton harness, on the other hand, is so modest in price that all this risk may be avoided. Cotton harness not only is strong and serviceable, but neat and attractive, matching up, point for point, with leather harness of the same grade. Cotton-web harness is made in brown, white and black colors.

The Russell Manufacturing Company also makes a great variety of halters, headstalls and surcingles, from the highest quality equal to the best English makes down to the cheapest grades. Halters and headstalls of cotton web are far more comfortable, winter and summer, for the horse than similar furnishings of leather. They are equally strong and durable. They are made in white, brown, blue, red and striped web, as well as black in the waterproofed. Surcingles are produced in every conceivable pattern, padded or not padded.

The packing and shipping of export orders have received the same careful study at the hands of the Russell Company as every other phase of their business. In this and in the preparation of documents to accompany the shipments the same painstaking thoroughness is exercised as in all else. The instructions given by the buyer are followed with the utmost exactitude. If no instructions are furnished the current rules and regulations of the country to which the shipment is destined are fully complied with. For price lists on the foregoing attractive lines, together with agency terms and further particulars, address The Russell Manufacturing Company at its export office, 60 Leonard St, New York City, U. S. A.

A Practical Concrete Mixing Plant

THE merits of concrete for various forms of construction have caused it to be used for an almost countless number of purposes, among which may be named dwellings, factory buildings, bridges, stables, garages, water and feed troughs, silos, fence posts and sidewalks. In fact, so general is its use that there are now few communities so small that some one in them will not be found engaged in the concrete contracting business. Cities and towns have found it to be the best material for sidewalks, culverts and small bridges, and the farmers are using it to a steadily increasing extent. It is well known that to obtain the best results with concrete it is absolutely necessary to have the different materials of the proper proportions and thoroughly mixed, and contractors handling large jobs invariably employ machinery for this purpose, not only for reasons of economy but also because they realize the importance of securing a positively uniform mixture.

As a rule, the mixing plants are too large and expensive to be used when a moderate amount of work is being done or by the contractor in a small way of business, and therefore under these circumstances the usual custom is to place the different ingredients on a wooden platform and mix them with a shovel by hand. This method is slow and expensive, and as it is hard work is apt to be carelessly done when the laborers are not closely watched. These are among the reasons that the "Big-an-Little" Concrete Mixers, manufactured by the Jaeger Machine Company, of Columbus, Ohio, U. S. A., are attaining ever increasing popularity all over the world. They fill the demand for a machine that can handle a fair-sized batch, give a reasonable daily output at a saving of time and labor, will stand up under the strain of the hardest usage by unskilled labor and can be sold at a moderate price.

A "Big-an-Little" concrete mixer is a complete plant in itself

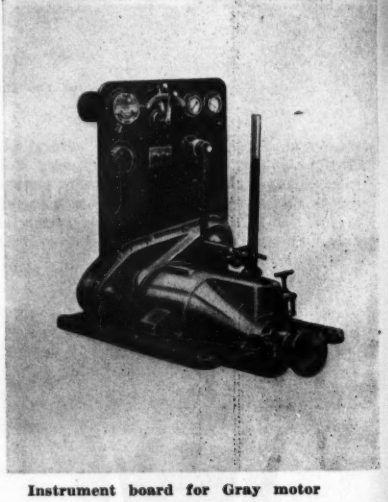
The "Big-an-Little" in its standard form is a complete plant in itself, mounted on a truck so that it can be easily moved from place to place. The drum, which consists of a single cone of sheet steel, is securely riveted to the lower part or bowl made of heavy semi-cast steel. Inside of this drum are three blades or plows, which revolve on a long center bearing and thoroughly stir and turn the mixture until it is a perfect conglomerate. The power to turn the drum is taken from a compact and efficient little gasoline engine mounted on the end of the truck and protected from the weather and dust by a sheet steel casing. Every part is rigidly braced to insure the greatest strength and durability, so that even with the roughest and most continuous service there is practically no outlay for repairs. The discharge is effected by means of a lever, which requires almost no exertion as the drum is balanced on a pivot.

If desired the mixer can be supplied on truck or skids without engine at a reduced cost, enabling those already having engines to use them. The manufacturers announce that in connection with their standard type of "Big-an-Little" mixer they have devised a very efficient loader and an auxiliary hoist that will be found extremely useful by builders and contractors for hoisting brick, mortar or other materials through an ordinary block to the top of any structure they may be erecting.

Illustrated catalogues fully describing the Jaeger products, together with prices and other particulars, can be obtained by any interested person upon request.

A New Engine Convenience

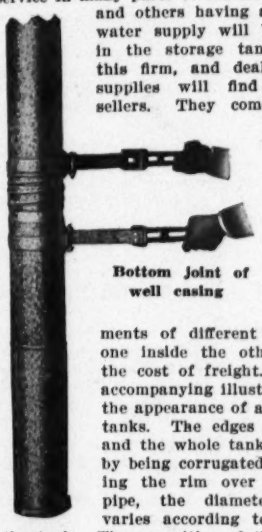
NO argument is needed to convince the boat owner of the advantage of having the various instruments used in connection with his engine placed in a position where they will be convenient to reach and at the same time be always in sight, as is the system adopted in automobiles. Realizing this fact, the Gray Motor Company have devised a method by which this object can be most admirably attained, so that the operator has at all times complete control of the engine and the boat, the same as he would have if he were driving an automobile. The new convenience, which the manufacturers term an instrument board, is intended to be used in connection with the new Gray model "C" engine and adds much to the appearance of any boat in which it may be used. There is mounted upon it the carburetor and spark control, magneto and lock, timer and oil feed indicators, all in plain view so that the operator can see how they are working. Those desiring further particulars regarding the new instrument board should write the Gray Motor Company, 734 Gray Motor Bldg., Detroit, Mich., U. S. A.



Instrument board for Gray motor

Steel Tanks and Well Casings

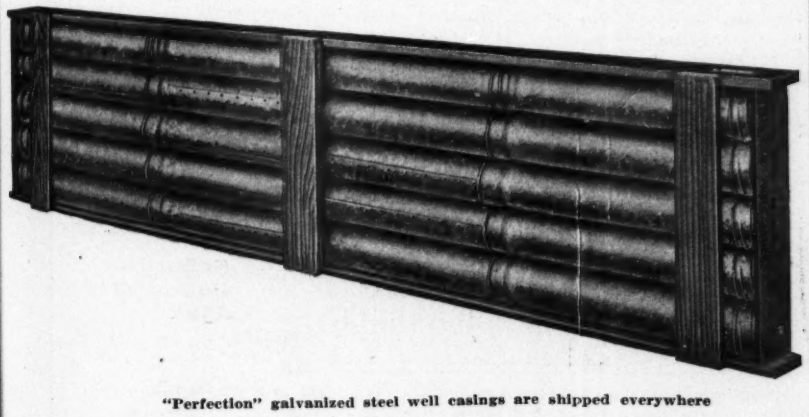
FOR many years the firm of Felker Bros. Manufacturing Co., of Marshfield, Wis., U. S. A., have specialized in the production of steel tanks, well casings and similar articles, both plain and galvanized, and their goods, which are marketed under the name of "Perfection," are now giving satisfactory service in many parts of the world. Farmers and others having an individual water supply will be interested in the storage tanks made by this firm, and dealers in farm supplies will find them easy sellers. They come in assort-



Bottom joint of well casing

ments of different sizes, nested one inside the other to reduce the cost of freight. One of the accompanying illustrations shows the appearance of a nest of these tanks. The edges are protected and the whole tank strengthened by being corrugated and by turning the rim over a solid iron pipe, the diameter of which varies according to the size of the tank. The capacities of the oval tanks range from 3 to 59 barrels, and the weight from 65 to 480 pounds, while the round tanks range in capacity from 3 to 65¼ barrels and the weight from 65 to 550 pounds. The other illustration shows a pair of "Never Slip" tongs connecting a bottom joint gravel shoe to a section of "Perfection" galvanized steel well casing.

The company also manufacture a line of large storage tanks, with capacities up to 322 barrels, which are intended to be shipped



"Perfection" galvanized steel well casings are shipped everywhere

knocked down, the construction being such that practically anyone can put them together; sanitary storage cisterns, with cone top, neck and removable steel cover; dipping tanks for breeders of sheep and other animals; cone-shaped tanks for windmills; sanitary garbage cans, with covers; gasoline and oil tanks, for use either above or below the ground; tank wagons, feeding troughs, etc.

In addition to the above, the firm call special attention to their "Perfection" galvanized steel well casing, which they state is the most widely used and popular casing in the United States. It is made in diameters ranging from 3 to 15 inches and weighs from 150 to 750 pounds per 100 feet. The lengths screw together and leave the inside perfectly smooth, with no projecting corners or edges to catch the drill or wear the rope. They are connected with the assistance of a pair of "Never Slip" tongs, which hold the pipe securely while the work is being done.

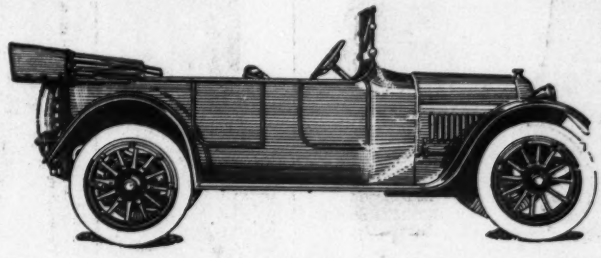
Felker Brothers Manufacturing Company have prepared a profusely illustrated catalogue in which will be found a complete description and prices of all their products, and they announce that they will be pleased to send a copy to any interested firm without charge upon request.

A Car for Discriminating Buyers

PROMINENT among the many attractive new automobiles that have appeared during the past season is the most recent offering of the Moline Automobile Company, of East Moline, Ill., U. S. A., which has been named the "Moline-Knight" in consequence of being equipped with the celebrated Knight sleeve-valve type of motor. Those who are familiar with the latest developments in the motor vehicle world need no information as to the advantages of this engine, but for the benefit of others it may be said that the manufacturers claim that it holds all world's records for power, endurance and economy, and they point to an official test conducted by the Automobile Club of America in support of this statement. In this test, which was conducted by disinterested engineers, a Moline-Knight motor was placed on a testing block and, after the electrical apparatus and carburetor were adjusted, was entirely enclosed by a wire screen to prevent any interference by others than A. C. A. engineers. After starting, this motor ran without any stop whatever for 337 hours, with wide open throttle and set spark, at an average speed of 1,117 revolutions per minute, giving an average brake horsepower of 38.3. The lowest horsepower reading for any fifteen minute interval during the entire period was 36.4, while at the end of the test, without stopping the motor, the speed was increased to an average of 1,678 revolutions per minute for one hour and an average of 53 brake horsepower developed.

In addition to the Moline-Knight motor the manufacturers have constantly striven to improve their car in all other particulars, so that the finished product apparently leaves nothing to be desired. The design of the body, with certain slight improvements, follows those most popular in Europe, and the result is a continuous unbroken bending line from the end of the body to the "V" shaped radiator. The body is unusually large, the dimensions being such as to allow two auxiliary seats if desired.

Partial specifications indicate the quality



The "Moline-Knight" car, which is equipped with the Knight sleeve-valve type of motor

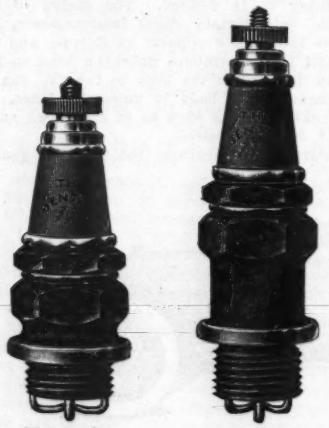
of the power plant, the Knight sleeve-valve type motor, of course, standing at the head. It has four cylinders cast en bloc, with a bore of 4 inches and stroke of 6 inches and is guaranteed to develop 50 horsepower. Other features are: electric self-starter; three-point suspension; thermo-syphon cooling system, with belt-driven fan; pressed steel frame; 128-inch wheel base; 56-inch tread, or 60 inches on special orders; selective, sliding gear type of transmission, with three speeds forward and reverse; center control; cone clutch, leather-faced with cork inserts; Bosch duplex magneto and plugs with dry batteries for ignition; lighting throughout by electricity; Schebler carburetor; force-feed lubrication; two brakes on rear wheels; semi-eliptic springs front and rear; Gemmer worm and sector steering gear, right or left drive; I-beam drop-forged front axle and full floating rear axle; artillery wheels, with wire wheels optional at additional cost, 36 x 4½ inches; two-cylinder, power driven tire pump; five-passenger body of extra large dimensions, ironed for auxiliary seats which can be purchased at any time; full equipment consisting of mohair top, top cover, inside attached curtains, automatic windshield, electric horn, Truffault-Hartford shock absorbers, auxiliary supply in main gasoline tank, Warner 60-mile autometer, gasoline and oil gauge on dash, dashlight for illuminating the gauge and speedometer, foot rail, robe rail, set of tools, jack, tire repair kit and eight-day clock. Prospective purchasers of automobiles should write for the handsome catalogue in which this machine is illustrated and described, addressing the company as above.

A Good Spark Plug for Dealers

EVERY motorist knows that a high-grade, durable and absolutely efficient spark plug—one that will stand up under the most severe service—is a necessity. The Benton spark plug, it is claimed by the manufacturer, fulfils all these requirements.

In the first place, it is case-hardened. The insulator is composed of sheet mica, spirally wound, lapped by a special process, and forced with great pressure into a taper hole in the case-hardened steel bushing. No mica washers are used. In this way a perfectly gas-tight joint in the plug is assured, and at the same time an insulation of the highest type that will not crack or deteriorate under the heat or oil of the motor is produced.

The electrodes are of extra heavy wire, drawn from a special alloy of platinum and nickel, and will neither fuse nor corrode. The Benton spark plug is not easily fouled by a deposit of soot or carbon, but, when necessary it may be cleaned very easily and kept in the best of condition at all times. All that is required is to unscrew the central electrode from the shell and scrape clean with a knife the mica insulation that is exposed. When replaced in the shell and the points properly adjusted, the plug should work perfectly, even in the most oily motor.



Motorcycle metric — 18 m.m. regular metric

Cross section, showing general construction

The Benton plugs are made in all sizes and types, and to suit all conditions. They are fully guaranteed. Any proving defective are replaced if returned to the factory for inspection.

Set of special Ford type plugs

One model of the Benton plug is designed to meet the exact conditions found on the Ford car. It has been demonstrated by actual trial, it is stated by the manufacturer, that a Ford motor using these Benton plugs will develop more power with less gasoline than with any other plug.

These spark plugs are also used with great success on motorcycles. E. G. Baker, who recently established a trans-continental record by riding a motorcycle across North America, wrote the manufacturer recently that part of his phenomenal success was due to the fact that he used Benton spark plugs, and that they never gave him a second's trouble in all his long journey. He adds that from present indications the same plugs are good for several thousand miles more.

These spark plugs are manufactured by the L. F. Benton Company, Vergennes, Vermont, U. S. A. Correspondence in any language relative to foreign agencies will be welcomed and will be answered fully and promptly.

Farm Implements for All Purposes

MESSRS. Parlin & Orendorff Company, of Canton, Ill., U. S. A., announce that they have now ready for distribution a new catalogue printed in French, in which will be found illustrations and complete descriptions of their extensive line of agricultural implements. Included therein is a large number of walking and riding plows; harrows, both disc and tooth, corn planters, cotton planters, cultivators, listers, coverers, and other implements for farm or plantation use. A detailed description of a new equalizer to be used when a number of animals are employed to pull a plow or other implement is also given and forms not the least interesting portion of the contents of this pamphlet. The product of this concern has acquired an enviable reputation for reliability and superiority of design, qualities that naturally appeal to the practical agriculturist. Owners or managers of farms, plantations, ranches, etc., or others who are interested in implements or machinery of this class should obtain one of these catalogues, copies of which will be sent to any part of the world without charge. Address Parlin & Orendorff Co., Export Dept. D. R., Canton, Ill., U. S. A.

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